MINING AND PETROLEUM STANDARD
AND
AMERICAN GAS-LIGHT JOURNAL.

Devoted to Mining, Petroleum, Gas, Water Supply, and Scientific Subjects Generally.

PUBLISHING OFFICE NO. 22 PINE STREET.

VOLUME VIII—No. 13.
WHOLE No. 169.

NEW YORK, WEDNESDAY, JANUARY 2, 1867.

$3 PER ANNUM
IN ADVANCE.

Thompson's Improved Gas Controller.

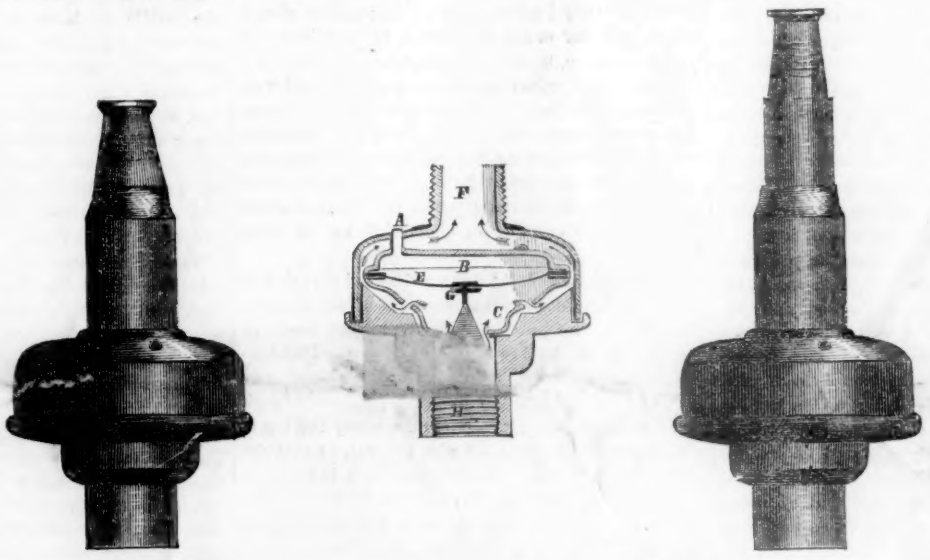
That "Economy is Wealth," is an adage that is as applicable in the consumption of gas for illuminating purposes as to any other necessary or luxury in life.

Gas-light is both a necessary and a luxury to a large portion of the population of our cities and towns. It is on this account that any improvement that tends to lessen the cost to the consumer is likely to be of interest. The enhanced price of coal and increased expense of labor for the last few years, has unavoidably increased the first cost of manufacturing gas, and consequently the price paid by the consumer has generally increased also.

The constant change that occurs in the pressure of the gas in the mains and service pipes, has always been a source of annoyance and positive loss to the consumer, as burned with the ordinary burner. Many devices have been invented and applied to remedy this defect, by using burners with a check or cut-off, or by filling the burner with some porous or fibrous material to effect the same end. None of these have met with more than a partial success, because a check to the flow of gas, to produce a good and economical light at a high pressure, will diminish or extinguish the light at a low pressure. The accompanying cuts show the construction and form of "Thompson's Improved Controller," which entirely obviates the above mentioned difficulties, by means of an *automatic* or self-acting cut off or valve, which keeps the pressure at the burner perfectly uniform and regular, and economizes all the gas, while an increase or maximum of light is obtained

The principle upon which this controller works is one well known to mechanics, and is simple in its operation. Within the small cylinder below the burner is placed a conical valve, (G,) attached to a movable diaphragm (E). The diaphragm rises or falls as the pressure of gas from the pipe is more or less, and the valve acts upon the valve-seat with such regularity of movement, that in a difference of from five tenths of an inch pressure to five inches, the variation in flame and of gas consumption is hardly perceptible.

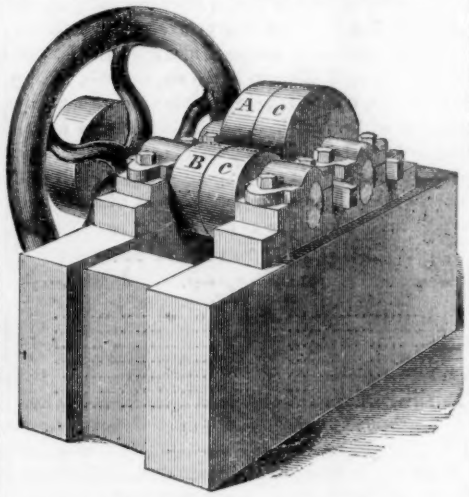
After passing the valve the gas takes the course represented by the arrows, to pass up outside the inner diaphragm case to the burner at F. A is an orifice which connects with the chamber above the diaphragm, to admit the atmosphere to balance the gas pressure below the diaphragm. So that the least change of pressure of the gas causes the diaphragm and valve to rise or fall. This admits the passage of a perfectly uniform quantity of gas to the burner; there is no waste, and a steady, soft flame is produced, which is important to all who read, write, or walk by gas-light, The unsteady and flickering variable light which invariably exists when the pressure of gas is not regulated, has injured the sight of thousands who have been subjected to it. The value and economy of these Controllers for street lamps, public buildings, and private residences, cannot be too highly appreciated. This Controller has been commended by many of the first Gas Engineers and officers of the different gas companies in the United States.



THOMPSON'S IMPROVED GAS CONTROLLER.

For further particulars call upon or address M. L. Callender, Agent, 22 Pine street, Room 9.

Agents are wanted for this and other cities and towns, to whom liberal inducements will be offered.



The Roller Quartz Mill.

It is asserted by those familiar with the subject, that after many years of experiments and experience in grinding ores for procuring the precious metals, there has never been a machine produced that equals the Cornish rollers for speed and capacity of work. But there is an objection to them on account of their wearing out rapidly; that is, when two plain cylinders are used in reducing ores to the condition of coarse sand, the middles of the cylinders are worn concave on their surfaces, which prevents them from being set up to grind to the required fineness.

By a very simple device in the present machine this difficulty is entirely overcome, as may be seen by referring to the engraving. A and B are two rollers, divided transversely through the middle into two sections, as shown by the lines C C. When the middles of the rollers become worn by use, as shown by the dotted lines, then one or both of the rollers are taken off of their respective shafts and reversed; the outer end or largest diameter of each section is placed in the middle, while the smallest diameters are at the outer ends. Each cylinder now presents a convex surface, and they will first touch in the middle, where nearly all the grinding must be done. By this arrangement they may be reversed indefinitely, and made to last any length of time.

Other parts of the machine are too well known to need description, except in a few minor points, as making the roller, B, about one half the diameter of A; and making the driving pulley twice the diameter of the roller B, using a very heavy belt with fly-wheel and no gearing. The large rollers are from 36 to 40 inches diameter, and the small one 20 inches diameter; the small one to run from one hundred to two hundred and fifty revolutions per minute, the large one running only by its attrition. But those machines with no gearing are not intended to be used as breakers, except for desulphurized ores, or for hard quartz, after it has been passed through a breaker To make this machine a breaker would require gearing.

In view of the late great discovery and improvements in treating auriferous quartz, whether of the plain crystallized quartz, or combined with the most refractory pyrites, by which means in a few hours the material may be reduced to such a friable state that it may be broken in the hand, as is demonstrated every day in this city by Dr. Hagen and Dr. Ayers respectively—it has therefore become necessary to increase the capacity of the machinery for pulverizing the material, after having gone through either of the above processes. At the same time it will reduce the cost of the machinery from 50 to 75 per cent. Hence this improvement in the well known Cornish roller, to meet the requirements of the miner; for the quantity of material that can be run through these rollers in a given time, is only a question of power, whether it be one ton or four tons per hour. They will grind to impalpable powder, or to coarse sand, and this is the time to treat the mass for free gold, after which, if there is any "flour of gold" remaining, the whole mass must be rubbed down to impalpable powder.

The last journal had an illustration of an improved Chilian mill, particularly adapted to following the rollers. Models of these machines can be seen at this office, or at 4 and 6 Pine street, Room 19, office of A. Hitchcock, inventor.

On the Combustion of Gas for Economic Purposes.

A Lecture delivered before the British Association of Gas Managers.

By Dr. Letheby.

(From the London Chemical News, No. 341.)
(Reprinted at Philadelphia in the Journal of the Franklin Institute.)

At the close of the last lecture which I had the honor of delivering to this Association at the meeting in Birmingham, I referred very briefly to the general phenomena of gaseous combustion, and to the principles of the economic use of coal-gas. It was my intention, indeed, to have entered fully into this matter; but so much time was occupied in the examination of the chemical and physical properties of the most important constituents of coal-gas, that little was left for the consideration of this part of our subject. I have, therefore, been requested to make it the especial subject matter of this evening's lecture; and, in order that you may follow me through the various details of the inquiry, it will be necessary to pursue it from the beginning.

The phenomena of visible combustion are always the results of energetic chemical action; and the heat and light which characterize it are the consequences of the violent collisions and rapid trembling of the combining atoms. When this collision occurs by the showering down, as it were, of gaseous atoms upon a solid, as you here see in the combustion of carbon and of iron in oxygen gas, and of antimony in chlorine, there may be a very intense ignition of the solid, but there is no flame. On the other hand, when the conflict is entirely among the particles of gaseous or vaporous matter, or matter in a finely divided and mobile condition, the phenomena are altogether different; for, although, as before, the atoms or molecules of the burning body are intensely heated, yet from their mobility they give rise to that appearance called flame.

In all cases, therefore, we must regard flame as gaseous, or vaporous, or very finely divided matter intensely heated. That the particles of the gas or vapor must be themselves bodily and intensely heated to produce flame is evident from this—that when I burn hydrogen, or coal-gas, or the vapor of ether, or alcohol by means of a finely divided solid, as I do here with a rosette of fine platinum wire, you see how the fire glows; but there is no flame, for the combustion is limited to the thin layer of gaseous matter which immediately surrounds the metal, and the temperature of the combustion is comparatively low. But if I raise it to a higher temperature, as will sometimes happen of itself, then the whole mass of escaping gas or vapor is thrown into a state of ignition, and it bursts into flame.

Let us pause for a while to study the complicated nature of this phenomenon. Whenever a gas or vapor burns in an atmosphere of another gas or vapor, as we here see in the flame of the burning gas and candle, the phenomena are very complicated. At the points of contact which are now at the outside of the flame, the collision of the particles, because of their rapid chemical union, is most violent; and here, therefore, we have the highest temperature; but as a portion of the outer atmosphere penetrates for some distance into the burning gas, it extends the conflict into the body of the flame, and there finding itself in the presence of complex particles, it closes with those whose energies are most active. In this manner the hydrogen of the hydro-carbon is burnt first, and the liberated carbon, standing for a while in an ignited state, forms the luminous shell of the flame; and within, waiting for the presence of air, or rather passing out to take part in the conflict, is the unchanged gas or vapor. Every common flame, therefore, consists of at least three parts: The inner layer of unchanged gas or vapor, next the shell or cone of luminous matter, and lastly, the outer shell of perfect combustion. That there is always an inner portion of gas or combustible vapor in every common flame may be proved by drawing it out with a glass tube and burning it at the end. See how I do it here with the flame of burning ether, and the same may be done with all other flames.

And now we are prepared to ask why it is that different substances burn with such different degrees of luminosity. The answer is clearly to be found in the circumstance that different substances contain, or evolve, or produce different amounts of solid particles. In all these flames of hydrogen, and sulphur, and carbonic oxide there are no solid particles to be heated; but in this gas, and candle, and paraffin lamp the particles of soot or carbon are very numerous, and if it so happens that the products of the combustion are also solid particles, the intensity of the light is so much the greater. Look at the splendid combustion of phosphorous in oxygen, and of magnesium in air. In both cases you will notice that the products are a white powder, every particle of which at the moment of its formation is intensely heated. It follows from this that every circumstance which increases the number of solid particles, within a reasonable limit, or which prolongs the time of their ignition, or which exalts the temperature of it, increases the light of the flame, and, conversely, everything which destroys the particles or lowers their temperature will also destroy the light.

If I throw the solid particles of lime into this almost invisible flame of oxygen and hydrogen, you will notice how vividly I bring out the light; and so, also, if I give the vapor of a hydro-carbon, as benzole, which is rich in carbon, to the hydrogen by merely passing it through a tube packed with tow, and moistened with naphtha, you observe how brightly the hydrogen burns. In the same way we can increase the illuminating power of coal-gas by passing it into a chamber containing naphtha; and experiment shows that with common 13-candle gas the illuminating power is increased about 4.5 per cent. by every grain of naphtha to the cubic foot.

On the other hand, if I destroy the solid particles by hastening their combustion, the light of the flame is diminished. Here, with a common Argand burner, I merely increase the flow of air to the gas by lengthening the glass chimney, or by enlarging the central aperture, or by driving the gas by great pressure through small openings, and you see how I destroy the light; and, worse still, if I mix air with the gas, so that the particles of carbon find themselves at once in the presence of atmospheric oxygen, there is no light at all. Let me blow out the gas-flame from this Argand burner, and put a piece of wire gauze upon the top of the glass chimney. The gas will now draw in the air and mix with it before it reaches the top of the chimney, and see how the light is destroyed. The same is the case with this burner of Professor Bunsen. It is a metal tube of five or six inches in length, and from a half to one inch diameter; the gas is admitted through a small aperture at the bottom of the tube, and just below this point there are four or five openings for the admission of air. As the gas issues from the jet and passes up the tube it draws in the air, and this, mixing with the gas, burns at the top of this tube without any light, but with great heat. This indicates to us the disadvantage of allowing air, even in small proportion, to get into the gas; in fact, experiment shows that with common 12-candle gas, the loss of light with different proportions of air will be as follows:

Loss of Light from Air in Gas.

Per cent. Air.	Loss per cent.	Per cent. Air.	Loss per cent.
1	6	8	58
2	11	9	54
3	18	10	67
4	26	15	80
5	33	20	93
6	45	30	98
7	53	40	100

(To be continued.)

Cause of the Smell of Hydrogen Gas.—If hydrogen gas be made to pass into pure alcohol, it almost entirely loses its smell. Water added to the alcohol renders it milky; and on resting some hours, a volatile oil separates, which is the cause of the well-known smell of hydrogen gas. This gas is obtained perfectly free from smell by putting into pure water an amalgam of potassium; but if there be added to the water an acid to accelerate the development of the gas, the latter will have the smell, which is observed during the solution of zinc in a weak sulphuric acid.

Singular Molecular Changes.

Take the alloy known as Newton's fusible metal, composed of eight parts of bismuth, five of lead and three of tin; melt and pour it out upon a marble slab, as soon as it becomes sufficiently hard and cool to handle, break it by a slight blow. The act of breaking it by a blow upon one part, will usually cause the whole to fly into quite a number of fragments, like glass. Immediately afterward, the metal, which was easily handled before it was broken, becomes so hot as to burn the fingers, if taken up. When the evolution of heat has ceased, the alloy will be found entirely changed in character. From being extremely brittle, it will then require to be bent to and fro several times before it will break. The broken surfaces, which in the brittle state were smooth or conchoidal, with a tin-white color, will now be found to present a fine granular or crystalline surface, of a dark color, with a dull, earthy aspect.

Similar phenomena accompany the melting and cooling of the fusible alloy of H. Rose, which is composed of two parts of bismuth, one of lead and one of tin. These facts were first observed and communicated to the public in 1842, by Robert Warrington, Esq., through the London Chemical Society. The fact of the evolution of heat from Newton's alloy, under other circumstances, had been previously alluded to by Berzelius, as follows: "If this alloy is plunged into cold water and quickly withdrawn and taken in the hand, it becomes sufficiently hot, after a few moments, to burn the fingers." We presume the plunging into cold water was done before the alloy was cooled to the ordinary temperature of the atmosphere.

These phenomena can only be accounted for by admitting a certain degree of mobility among the component particles by which a second molecular arrangement takes place after the metal has solidified; this may possibly arise from their not having assumed in the first cooling, that direction in which their cohesion is the strongest.

That a very marked and extraordinary alteration in the characters and properties of various metal arises entirely from this change in the position of their molecules, effected either by the communication or abstraction of heat after solidification, there can be no doubt. These changes, moreover, are applied to many very important purposes in the arts—such as the hardening and tempering of steel; the rolling of commercial zinc, and rendering that metal permanently malleable, the annealing of glass, cast-iron, etc.—all of which proceses undoubtedly depend upon the same principle as that involved in the curious phenomena above alluded to in the case of the Bismuth alloys. A great variety of other uses, particularly in crystallization, might also be referred to.—*California Min. and Scientific Press.*

A Mineral Belt.

A writer in the Quincy (Plumas county) *Union* calls the attention of capitalists and others to the quartz ledges on the Eureka Mountain range, extending from the Middle Yuba to the Middle Feather river. He says:

"The range or belt is from a half to two miles wide, running southeast and northwest, on which there are some of the best paying ledges in the State, now paying immense dividends. Going northwest from the Middle Yuba, we came to the Keystone ledge and mill, which has paid and is now paying handsome dividends; thence on to the Sierra Buttes, (Reis & Co.,) which is paying—and has for twelve years—better than any ledge in the State, save the Allison. Thence to Independence, Gold Lake, Gold Valley, and Spencer & Gray's ledges and mills, on all of which have been erected ample machinery, and bid fair to become paying property. Four miles north-west of the latter ledge we came to the celebrated Eureka lode, in this county, on which are located the Rough and Ready, the Seventy-Six, Eureka and Mammoth claims."

The mineral belt referred to above, says the Nevada *Gazette*, extends in a southeasterly direction through Eureka and Washington townships, in Nevada county, where active operations are now being carried on in the way of prospecting, opening ledges, and erecting machinery. Some of the ledges in this belt, in Sierra and in Plumas, are among the most valuable in the State, and we anticipate that mines equally as valuable will soon be developed in the upper part of this county.

The Process of Roasting Ores.

nslated from the German of F. Plattner, for the MINING & PETROLEUM STANDARD AND AM. GAS-LIGHT JOURNAL, by

J. H. TIEMANN.

tered according to an Act of Congress, in the year 1866, by t, Callender & Co., in the Clerks Office of the District Court United States, for the Southern District of New-York.]

NUMBER VIII.

cause the opportunity for the sulphurous acid gas h is set free, to enter into combination with the gen of the air by contact, is here given to the full- xtent, for the air is continually passing through interstices of the ore, which are filled with the ed gases. The formation of sulphuric acid in this ner seems the more probable, for the reason that n sulphur metals are roasted, those metals, which high temperature have the property of forming rent but distinct degrees of oxidation, always com- with oxygen at first in the lowest degree, and af- rds pass to the higher; as for instance iron and er, both of which metals at first form respectively xyd and suboxyd, and only at a later period, if itted to do so, pass to the sesquioxyd and pro- d.

order to discover how those different metals and oxides with which the millman commonly has to act as "contact substances" on a mixture of sul- ous acid and atmospheric air, the mixture being r dry or moist, I constructed an apparatus, by s of which I could pass the mixture of sulphurous (made from copper and sulphuric acid) and atmos- ic air (from a gasometer) in any desired quantity, r dry (by passing it through tubes, some filled pieces of pummice stone impregnated with fuming uric acid, and others containing chloride of cal- or moist, through a thick glass tube. Before be- ing the real experiment I tested the fitness of the ntus, by passing a mixture of two volumes of sul- ous acid and five of air, both wet and dry, through empty tube heated at one point to a glow, and after having inserted in the tube a spiral wound a wire. In the first case there was no sulphuric formed, but when the wire was put in and heated dark red, there appeared instantly at the open end tube fumes of sulphuric acid, whether the mix- was dry or moist. The apparatus was now ready sting other substances.

the different substances which I selected for the iments, each one separately, in a fine powder, was d in the glass tube in a little heap about three in from the open end, so that it might be heated or less as required. As in a roasting process in rge way the admitted air always carries a little ure, and when the roasting is carried on in a re- ratory furnace, where the flame passes from the ox directly into the roasting chamber, water gas rheated steam) is carried over with the products mbustion, a part of which may come in contact the ore, so in the first experiments the mixture of urous acid and air was passed through the tube , and as in roasting in a large way in so-called l furnaces, the products of combustion are not ad- d to the roasting chamber, in the second experi- e the mixture was passed through the tube dry. the treatment of various substances in the above ined way, they were treated with water to test for sulphates and sulphuric acid, and where me- or oxides had resulted from the treatment, they analyzed to find out the degree of oxidation.

e results obtained in these experiments with dif- t metals and oxides, as well as with caustic lime ure chloride of sodium, were, as far as relates to s mixture, namely, whether used moist or dry, e the same.

Metallic gold and silver in a finely divided state, d gently, caused the formation of sulphuric acid, ut themselves being changed.

Metallic iron (made from red hematite, by fusing igh heat for a long time, with charcoal impreg- with a solution of carbonate of potash,) in a pow- der heated gently, glowed of itself, changed to sesqui- oxyd with protoxyd and protosulphate, at the same time a smell of sulphurous acid was perceptible at the open end of the tube. When too smell a quantity of air was admitted, the greater part of the iron changed to a simple protosulpdhide, and a small part to mag- netic oxyd, sulphuric acid being formed at the same time. The cause of this, as will be more fully explained hereafter was, that most of the sulphurous acid changed to sulphur and sulphuric acid, the first of which—sul- phur—combined with the iron, while the latter—sul. phuric acid—for the most part passed off, but a portion of which appeared to have an oxidizing effect on the iron.

3. Magnetic iron ore, Fe O, $Fe^2 O^3$ at a low heat changed partly to proto and persulphate, a slight odor of sulphurous acid being perceptible at the same time at the open end of the tube, and some sulphuric acid con- densed in the tube near the substance. In dissolving the sulphates formed, a quantity of red sesquioxyd re- mained, which contained but a small quantity of unde- composed magnetic oxyd.

4. Red hematite ore $Fe^2 O^3$ caused the formation of sulphuric acid, part of which, when the temperature was not too high, entered into combination with the oxyd; this compound, however, at a slight increase of temperature was decomposed, so that when treated with water but a small amount of persulphate was dis- solved, but upon treating the residue with hydrochloric acid, a considerable amount of sulphuric acid was found in the solution. Sulphuric acid had condensed in the tube almost to the open end.

5. Metallic copper changed partly to a suboxyd and sulphate, while at the open end of the tube, but a slight odor of sulphnrous acid was perceptible (this experi- ment was not continued till the copper was completely oxidized).

6. Red copper ore $Cu^2 O$ changed rapidly to protoxyd and this again to sulphate, while but a very small amount of sulphurous acid passed off.

7. Protoxyd of copper, Cu O changed to sulphate without sulphurous or sulphuric acid being perceptible at the end of the tube.

8. Protoxyd of lead, PbO, changed to sulphate with- out setting free either sulphurous or sulphuric acid.

9. Oxyd of zinc, ZnO, changed to sulphate, while fumes of sulphuric acid were disengaged.

10. Sesquioxyd of cobalt, $Co^2 O^3$, changed to sulphate without any perceptible disengagement of sulphurous or sulphuric aoid.

11. Protoxyd of nickel, NiO, changed to sulphate. some fumes of sulphuric acid being set free.

12. Red oxyd of Manganese, Mn O, $Mn^2 O^3$, changed to sulphate without emitting any fumes of sulphuric acid.

13. Caustic lime changed to sulphate (gypsum), no fumes being perceptible.

14. Rock salt, Na Cl, caked at a low heat, changed to sulphate and chlorine was set free.

Although from the foregoing experiments it may be assumed with certainty, that in the roasting of different sulphur metals by admission of atmospheric air, sulphu- ric acid is formed, by the combination of the sulphur- ous acid which is set free in the oxidation of the metals, and the oxygen from the admitted air, by contact with the finely divided heated spongy substance, and that a part of the already formed oxides combines at once with the sulphuric acid, when the heat is not too high, and the inclination to combine has been sufficiently excited, it may still be conjectured that the sulphurous acid set free by the oxidation of the metals, under certain cir- cumstances, in the absence of a sufficiency of air, takes up oxygen perhaps, from the oxides with which it comes in contact, thereby forming sulphuric acid.

[Editors of Journals may copy these articles by giving proper credit, and marking the same as copyrighted. EDS.]

COMPOSITION ROOFING.—James G. Holliday, Wheel ing, West Virginia.: This invention consists of a com- position roofing, formed for combining coal-tar, still bottom of petroleum, acid-tar, finely-ground brick-clay, and refuse lime from gas-house, with each other.

Steel Rails.

The immense importance to the railroad interests of the United States, both for roads in operation and pros- pective, of a better and more durable material for rail- ways than iron, is so fully shown in the subjoined arti- cle on experiments in England, taken from the *Journal of Engineering*, that we desire to re-produce it. We have lately seen plans for making steel directly from the ore, which is claimed to be superior to the Besse mer steel, and cost 40 per cent. less, by the use of a small proportion of Franklinite, which surely must be a great advantage to this country, when put in prac- tice:

"Steel has many important advantages over iron be- yond that of its superior durabiiity. It is a considera- tion of much importance that steel rails would not involve more than one-fifth the interruption of the line consequent upon relaying. But it is a very much more valuable property of Bessemer steel that it is secure against breaking. For when we speak of steel rails we assume that they are under a contract by which any bar taken at random, must withstand the blow of a weight of one ton falling twenty five feet, the rail being laid upon three feet supports. Steel rails may be taken up during a hard frost and bent double under a steam hammer without breaking, although steel that would stand this test without cracking would be somewhat softer than would be desirable. The test by a ton weight on a twenty-five feet fall should be enforced un- der all contracts for steel rails. Any good steel rail will withstand it perfectly, while an iron rail would be broken with the same weight on a five, or at most a ten feet fall. Steel rails, besides their greater durability and tensile strength, will bear, as girders, nearly twice the load of iron rails of the same section, as carefully ascertainrd by Mr. George Berkley, the engineer to the Great Indian Peninsula Railway Company, and who has ordered many thousand tons of steel rails. The greater stiffness of the steel rails enables it to distribute the weight upon the wheels of a train over an increased number of sleepers, and thus over an increased surface of ballast. The line therefore remains in better condi- tion than when laid with iron rails, and there is far less weakness at the joints. The ends of steel rails, espe- cially when they are not flushed, have been fully proved to be at least ten times as durable as the ends of iron rails, being at once stiffer, harder and tougher- Old steel rails, too, bear at least as high a proportion to their original value as iron rails.

"It is a fact that steel plates worth £30 per ton in the market are rolled from the crop ends of steel rails, and these which will pile and weld, are now worth from £7 to £8 per ton, new rails selling at prices varying be- tween £12 to £16. Old steel rails can be melted in a cupola into a white iron: they can be reconverted along with new metal in the converter; they can be at once heated and be rolled into bar steel and plate steel of good quality. Considering, therefore, that they have no disadvantages as compared with iron rails, ur- less it be their far greater durability, it is not remarka- ble that they are coming into rapid use, nor that the London and North Western Railway Company should have established large and costly works of their own at Crewe, capable of making 360 tons of steel weekly. Sixty-three miles of the company's line were already laid with steel rails at the time of the last half-yearly meeting.

"The Great Northern Company have decided to lay steel rails through their principal stations and upon all the inclines upon their line; but when we consider that, with the exception of a short length of one in 110 near Kings-cross, none of their inclines are steeper than one in 168, and that they are mostly one in 200 we cannot doubt that steel will soon be adopted for the whole line. As for other lines, we may say that at least 1,000 tons of Bessemer rails are made weekly in England and Wales, and probably on the continent of Europe. The evidence in favor of steel is now become so clear, and the reasons for its immediate adoption so obvious, that we cannot but think that it is a most mistaken policy for engineers and railway managers to longer postpone the use of steel, whether upon the ground that it will yet become cheaper or otherwise. A generation of iron rails will have worn out before any considerable reduction can be expected in the price of Bessemer steel. One cannot doubt that the time will come when iron rails will be obsolete, just as the old cast-iron tramps, and after them, the fish-bellied rail passed out of exist ence.'—*Engineering.*

A Powerful Source of Artificial Light.

By WILLIAM H. HARRISON.

[From the British Journal of Photography.]

One of the most brilliant discoveries made within the last few years has just been made public by its inventor, who has not only discovered a new principle in electrical science, but has applied it to the construction of a machine which, by means of the carbon points will give light of much greater brilliancy than has hitherto been produced by man. The present apparatus is made on a grand scale, but it remains to be seen whether a small machine cannot be made to work by hand, whereby the electric light can be produced at the mere cost of the labor and the electrodes. So powerful is the current of electricity evolved by the present apparatus, that ordinary photographic paper, at 2 feet distance from the light, blackens in twenty seconds to the same degree that it will darken by exposure for one minute to the direct rays of the noon-day sun on a clear morning in the month of March.

This invention was first made known to the public by Professor Faraday, a week or two ago, at a meeting of the Royal Society. The paper containing the information was a very long one, sufficient to fill a whole number of this *Journal*, and was written by the inventor, Mr. H. Wilde, of Manchester. Some notes of the substance of its contents, and the marvelous effects produced by the powerful currents evolved by the apparatus, will be of interest, considering the promise of the invention when regarded from a photographic point of view.

Mr. Wilde first made a large hollow metallic cylinder, with sides of iron, separated by a thick diaphragm of brass. This composite cylinder had its metallic parts bolted together by screws of brass. Permanent magnets could be placed over the cylinder, so that their poles would bite and make good contact with the opposite iron sides. The internal diameter of the cylinder was 1¾ inch. The four or five horse-shoe magnets which could be placed over it, each weighed about one pound, and would each sustain a weight of ten pounds. Thus, when the magnets are mounted over the cylinder, the two iron sides of the latter become virtually the poles of one very powerful magnet. The armature is a long solid bar of soft iron, made to revolve inside the hollow portion of the cylinder. This solid bar has a deep longitudinal groove on each side of it, in which groove the insulated wires of the armature are placed, so that the latter has still a cylindrical form externally. It will be noticed that this arrangement is, in principle, that of the ordinary magneto-electric machine, though somewhat differing in form from those of the usual construction.

With apparatus thus arranged, Mr. Wilde connected the terminal wires of the armature with a common tangent galvanometer, to measure the electricity evolved as each permanent magnet was added to the outside of the cylinder. He found that the electricity produced was in direct proportion to the number of magnets on the cylinder. But now comes the wonderful part of the discovery. When the induced current of electricity from the armature was passed round an ordinary electro-magnet, the soft iron bar, the latter actually lifted 178 pounds, whilst the four permanent magnets on the cylinder, the original source of the power, would only lift a weight of 40 pounds. The effect here produced seems to be out of all proportion to the cause, and it will be seen what an important bearing the discovery has upon the law of the conservation of energy. Having made this first step, Mr. Wilde constructed a second cylinder, larger than the first, and placed outside it electro-magnets instead of permanent magnets, the two machines being then worked together, and the current generated by the first being employed to excite the electro-magnets of the second. By this arrangement twenty-four inches of No. 20 iron wire, 0.04 inch in diameter, were made red-hot. Lastly, a machine with an iron armature ten inches in diameter was made, the total weight of the whole apparatus being four and a half tons. The three machines were then made to work together, and the armature being driven, as before, by steam power, the results proving most astonishing. Pieces of cylindrical iron were melted by the current, which also melted seven feet of No. 16 iron wire, 0.065 of an inch in diameter, and made twenty-one feet of the same wire red-hot. Mr. Wilde says: "The illuminating power of the electricity from the intensity armature is, as might be expected, of the most splendid description. When an electric lamp, furnished with rods of gas-carbon half an inch square, was placed at the top of a lofty building, the light evolved from it was sufficient to cast the shadows from the flames of the street lamps a quarter of a mile distant upon the neighboring walls. When viewed from that distance the rays proceeding from the reflector have all the effulgence of sunshine. Lastly, as already stated, photographic paper is blackened in twenty seconds by this artificial light, to the same extent that it can be darkened by sunlight in a minute."

Such is the substance of the wonderful discovery made by Mr. Wilde. It is evident that its value to the photographer is a question of expense, there being no doubt as to its utility. As the most economical proportions of the parts of such machines become better known by experience, it is to be hoped that the maximum of light and minimum of mechanical power, will be so altered from their present relative positions that the invention will be, to some extent, available to the photographer, and render him more independent of the weather. With the exception of the mechanical power, the expenses connected with the working of the apparatus are nominal. Ordinary wear and tear, the consumption of the carbon points, and the gradual burning away of the contact places of the necessary commutators, are inexpensive items, offering no impediment to the general use of the machine. Whether the expense of the mechanical power can be so reduced as to make the invention commercially available in the photographic world, is the only question hanging over one practical application of this, one of the noblest scientific discoveries of modern times.

Lecture and Experiments.

By PROFESSOR DOREMUS.

A very select and intelligent audience assembled on the evening of the 21st ult., at the Lecture Room of the Bellevue Hospital, to witness the experiments by Professor Doremus with gaseous liquid and solid carbonic acid. The lecture and demonstrations were highly entertaining, and secured the warm approval of the audience, who frequently vented their satisfaction in enthusiastic applause. The lecturer began by explaining the nature of carbonic acid and the manner of its production. It was easily fabricated from different substances, or sprung up spontaneously in certain localities from the crust of the earth. He then took a piece of common bread, and by burning it, produced the acid. A diamond was then placed upon a platinum support, and by burning it with hydrogen and then covering it with a jar of oxygen, a white precipitate was produced, the same as with the bread. The acid was also obtained from the respiration of a rabbit, from a burning candle, and from lime dust. The Professor referred to the deleterious effects of inhaling this gas, and took occasion to enforce a few precepts in regard to ventilation. But though harmful when inhaled it was not only innoxious but exhilirating when taken into the stomach, as in the form of soda-water or champagne, besides being a powerful solvent. For this reason it was deleterious to health to drink water from bad pipes, as analysis showed that it contained a solution of carbonete of lead. He recommended the nse of lead pipes coated with tin, thus securing sufficient flexibility and obviating the evil effects of the lead in contact with the water. The gas was then subjected to pressure and converted into the liquid form, and then the pressure being removed a portion of the liquid evaporated, while another portion remained in the form of a beautiful solid of snowy whiteness, and of a temperature of 100° *below zero*. In this condition it might be handled with impunity; but put some ether with it, and the intense cold produced would blister the hand. An egg was then placed in this solid gas and a little ether added, and the intense cold thus produced by the rapid evaporation resulted in a coagulation of the albumen like that of cooking by heat, and rendering the egg hard that the Professor had to throw it on the floor several times with great force before it could be broken. Mercury was then frozen into solid bars by the same means, and taken from the mould and beaten with a mallet on an anvil. Some of the solid carbonic acid was then placed in a platinum vessel, which was heated red hot, and some water being put into it, it was converted into snow, with which the Professor snow-balled the audience. Other experiments were performed with the acid, much to the satisfaction of the audience, who seemed to be highly gratified with the evening's entertainment.—*N. Y. Sun.*

Auriferous Ores and Sodium-Amalgam.

An interesting series of experiments with sodium amalgam in the treatment of auriferous ores has been conducted under the superintendence of Prof Silliman and the results obtained have been highly satisfactory. He states that having at his disposal a considerable quantity of California gold quartz from a mine in Calaveras county, he proposed to Mr. Wurtz to subject the ores to his method of amalgamation, under conditions subject to control, both as expressing the actual value of the material experimented on, as well as giving the value of the result and the loss in the process. The crushing and grinding was effected in the apparatus of B. Dodge, of New York, which, doing its work well, gives unusual facilities for exactness. The details obtained in these experiments as to the degree of comminution reached by this apparatus have been carefully worked out, but are reserved for a future communication, having no bearing on the subject now before us, although believed to be of value to the ore-dressing. After detailing the several experiments which were actually concluded, Professor Silliman continues that the experiments are still in progress, but results show that with unaided mercury the gold is less than 60 per cent. of the whole quantity of known to be present. In one experiment less than per cent. was saved, while by the aid of the amalgam of sodium the saving is increased to 80 per cent. or per cent., or an increase of more than 20 per cent. the gold present in a given case may be saved, and many cases, where the gold is coarse and free, that better results than this may be attained. The first periment detailed in which a different amalgam apparatus was used gave results surprisingly close does not think the barrel as good a form of apparatus for this description of amalgamation as some one of numerous forms of pan now in use. It was employed in these experiments simply because it was a convenient means of treating small quantities of ore in making comparative experiments. Experiments in California under his direction, have been set on foot upon a scale of magnitude adequate to test the value of this discovery in the metallurgy of gold in a satisfactory manner, the results of which may now be looked for at no distant day. With regard to the mode in which the sodium acts, Professor Silliman remarks that the action of the sodium in this case appears to be in a measure electrical, by placing the mercury in a highly electro-positive condition towards the electro-negative metals, seeming to give some reason for the term Magnetic Amalgam, adopted by Mr. Wurtz as the trade-mark for the alloy. The quantity of sodium is entirely too small to allow of the supposition that it acts by its chemical affiinities. It is well known to chemists that the metallic sulphides are decomposed by amalgam of sodium, but no one supposes that an inventor could be found Quixotic in his chemical notions as to seriously propose the use of sodium amalgam as a means of effecting the reduction of the sulphides of silver, &c., since not more than one equivalent of sodium would be required to set at liberty one equivalent of silver. The use of the sodium amalgam for silver amalgamation must depend if found really useful in the large way in the silver reduction process (which still remains to be proved) upon the like power of electrical action to that seen in its

gold, and also to the well known power of prevent-
he granulation (flouring) of mercury, or of saving
ercury when thus changed. Indeed, there is good
n for believing that a most important part is play-
y the sodium amalgam in this last particular. The
gam of gold or silver is very liable, as every mill-
knows to his loss, to granulate and disappear from
lates of the battery, or from the riffles, after it has
formed. If this granulation takes place it is al-
impossible, by the existing modes of amalgama-
to recover the minute particles, which float off
the currents of water and are lost. The action of
sodium in recovering the mercury which has pass-
nto this condition is, perhaps, its most remarkable
erty.—*Mining Journal.*

Correspondence.

Nicholson Pavement and Plastic Slate.

DITORS OF THE AM. GAS-LIGHT JOURNAL:

hat interesting communication in the *N. Y. Tribune*
morning on this subject, showing its advantages is
t comforting to our weary eyes and dust-charged
iratory organs. Let us try it thoroughly, and
all the aids and helps we can gather from the
quarters of the world. Let every lover of quiet
order contribute his mite from his store of know-
e whether it be large or small. I send you mine.

perceive that coal tar is relied on to keep moisture
of the wooden blocks and to preserve them. This,
nk, is a false confidence. My reason and observa-
satisfy me that coal tar will *not* prevent absorb.
I will take a porous substance and *saturate* it with
l tar (give it all it will hold) and after a little time
been given for evaporation, I will so fill it with
r that but for the color and smell you would sus-
nothing in it but water.

oal tar will permeate wood to a small extent but
r will enter with it and to a much greater extent.
efore, those blocks of wood will absorb and decay
st as rapidly as if the tar was not present.

ut moisture being in the wood, as well as all around
hat may we expect from the omnipotent power of
t? Why that the wood and dirt will expand. But
bound by the curbs so it can't. Well, then it will
press, which is just as bad, for when the grain of the
d has been compressed on all sides, and the water
gone off, the wood will not return to its natural
e, but the blocks will be loose; then more dirt will
in and then water and frost, and the process is re-
ted over and over. But it is a mistake to say that
curbs will prevent expansions. It can come *up*
d it will. But it may not rise *evenly* and then the
uble begins. Hollows will be formed into which
ter and dirt will settle from which cause other
ubles will arise.

What we want is something that will not absorb but
el water.

A putty of white lead would do it, but that is too
pensive. Pitch would do it if it would remain flexi-
, but when it gets cold it is brittle and the motion of
blocks would crush it all to powder, and it would
get heat enough then to liquify and unite again.
ere may be other things that would answer, but I
ow of nothing that fully meets the requirements of
s case, except the newly discovered mastic of slate
d coal tar, that has created so much interest all over
e world for roof covering for arches, vaults, culverts,
sel-bottoms and sides, foundations, and brick or wood
rk generally, (when it is exposed to moisture), in
l kinds of relations and shapes.

his substance seems to possess most wonderful qual-
es, and I have no doubt would meet the wants of
s pavement to the admiration of the contractors and
e public. It will certainly foreclose the entrance of
oisture to anything covered with it. It will remain
xible in or upon the ground for an age, because,
ough its nature is to petrify in heat, it will not get
at enough in that situation to become fragile slate in
fty years. Should the pavement get so hot as to *char*
the wood—(it cannot possibly burn if surrounded by slate) then the slate would be petrified so far as it was red hot and no further. As to cost, it would be less, I think, than the present method. The slate need not cost as much per pound as the tar and it would take three to four pounds of slate to one of tar. There would also be less need of dressing the blocks, because the mastic would fill up the irregulaties, and stay there, for it is wonderfuily adhesive. Let it at least be tried.

CITIZEN.

Dec. 13th, 1866.

Explosion at the Astoria Gas Works.

THE BUILDING COMPLETELY DESTROYED—NO LIVES LOST.

At eleven o'clock yesterday morning the village of Astoria was startled from its usual quiet by a sudden explosion, which shook every building in the town, and for a short time created no small alarm among the residents. The sound was not unlike that occasioned by the discharge of a heavy columbiad, and gave rise to a variety of rumors as to its cause. It was heard with great distinctness on the New York side of the river by residents in the vicinity of Ninty-second-street, and was by them supposed to proceed from the large kerosene oil works located immediately opposite that section of the city.

Great consternation was created in the public school in Astoria, the scholars and teachers all leaving the school building in haste, in consequence of the severe shock which it sustained. The school-house is situated not very far from the scene of the explosion. Instead of the kerosene oil works, however, it was soon ascertained that the explosion came from the gas-house of the town, which is situated at the foot of Franklin-st., and distant from the Ninty-second-street ferry about four hundred yards. The cause of it was the ignition of gas, which had by some means escaped from the "purifier," and completely surcharged the purifying room; but how this escaped gas became ignited is a mystery. The purifying room was located in the rear end of the building, furthest from Franklin-street, and the rear wall was forced completely outward, and fell to the ground a heap of crumbled bricks and mortar. The explosion seems to have also expended a good part of its force on the side walls and on the roof. Of the former but little is left standing, while the latter was completely carried away. Bricks and broken timbers were thrown into the air to a considerable height, and came down in a perfect shower, the débris being scattered around in all directions. Fortunately no person was injured by this accident. There was no one in or near the building at the time of the explosion, as, the works being small, but few persons are employed in them, and during the morning no necessity exists for their being at work. The machinery of the works except the purifier which exploded, is but slightly damaged, and, were it not for the intense frigidity of the weather, gas manufacture could be immediately resumed. The building, however, is a complete wreck, and will have to be erected anew, as the portions of the front and side walls left standing have been too severely shaken to admit of being farther built upon The purifying room was forty to twenty feet in size and the entire structure was about seventy feet long by thirty five wide. It was—as are all buildings used in the manufacture of gas—only one story in height. The damage done by the explosion is estimated at about $9,000. There was no insurance on the property. The works were owned by Stephen A. Halsey & Son, of Astoria. Temporary buildings will be at once erected, and it is contemplated to resume the work within a week at farthest. The town of Astoria has enjoyed the convenience of gas-light for abont thirteen years, the building destroyed yesterday morning having been erected about that time. The works came into the possession of the present owners about six years since, they having purchased them from the corporation which originally erected them. Norwithstanding the explosion there was fortunately gas sufficient in the reservoir, or "holder" as it is technically called, to supply the consumers until about half-past nine o'clock last evening, after which time they necessarily had to resort to the more primitive mode of lamps and candles, in order to dissipate the semi-darkness, the moonlight preventing total gloom. Mr. John Clarke, Superintendent of the works, had a narrow escape from injury when the explosion occured. He was at that time on his way to the building, and had arrived within thirty-seven yards of the main entrance, when he heard the report and noticed the wall bulging outward. He immediately retraced his steps and escaped without being hurt by any of the falling débris.—*Herald.*

Miscellaneous Items.

THE consumption of petroleum in Europe in 1864 was 30,000,000 gallons against 17,000,000 in 1862, the probable consumption in 1866 is estimated at 90,000,000 gallons.

SAN FRANCISCO, Dec. 24, 1866.—Mining stocks are quoted as follows:—Savage, $1.975; Yellow Jacket, $1,305; Crown Point, $1,260; Chollar Potosi, $221; Belcher, $120; Ophir, $165; Legal Tender, $64.

THE YIELD of the precious metals in the United States for 1866 is estimated at $85,000,000, by the American *Exchange and Review* of New York. The largest proportion is, of course, from California. Then follow in order, Nevada, Montana, Idaho, Oregon and Colorado.

LINING FOR STEAM CYLINDERS.—An invention which has for its objects the prevention of the escape of heat from steam cylinders, and the condensation of steam therein, has recently been afforded provisional protection in England. It consists in lining the cylinder with wood or some other material which has a low conducting power.

Dr. A. HILL of Norwalk, Conn., has recently patented a process by which ineffaceable paintings can be done on marble. The colors are fixed as permanently as they are in stained glass, and the process of applying them is said to be simple and rapid of execution.

PHOTOGRAPHING UPON SILK.—A process has been devised at Lyons, the great silk manufacturing locality of France, for photographing upon silk, linen, etc., so that persons, instead of marking their initials upon the corner of a handkercheif, can have their photographs taken upon the fabric. In the silk shops various articles are exhibited, photographed with names, portraits and fanciful devices. The pictures are not injured by washidg, and the process is said to be easily and rapidly effected.

THE Reese River *Reveille* describes a singular plant lately found growing in the hot water of Hot Creek district. It is a delicate vine-like plant, almost as fine as hair, holding myriads of tiny leaves, nearly imperceptible, and of bright emerald green. It thrives only in water so hot that the hand cannot be borne in it. Many efforts were made, in spite of scalded hands, to gather and preserve specimens, but it was so tiny and delicate that it was found to be impossible.

THE *Chemical News* quotes from *Les Mondes* a simple mode of engraving, intended to replace wood-cutting: "The inventor starts with a smooth piece of chalk, on which he makes his drawing with gum-water, or something else that will harden on the chalk. He then, with a hard brush, scrubs out the soft part not drawn on, and so gets his design in relief. He subsequently hardens the plate by putting it in a bath of gelatine and then drying it."

—Professor Playfair recently mentioned, before the British Association, as an object of peculiar interest, a furnace at the Alfreton Iron Works, which was forty or fifty years old, whereas the average duration of iron furnaces was only four or five years. Recently a part of the wall was taken down for repairs, and he then had an opportunity of examining the whole of the furnace, and of astertaining how it was that it lasted so long. To his surprise he fonnd it lined with plumbago three or four inches thick, not by the manufacturer, but by the operations of nature. This result he attributed to the carbon in the iron having been squeezed out, and the whole of the furnace was probably lined with plumbago.

Peat in Michigan.

The Detroit *Free Press* has an interesting article upon this subject. The peat is found in dry bogs, of which there are several hundred in the State. The supply is believed to be, practically, inexhaustible. It is also of a very fine quality. Professor Douglass, of the State University, after a careful analysis, places the proportion of ash and sooty matter at only three and two-tenths per cent. It is generally known that peat is the vegetable soil of swamps, made up of matted roots, leaves and stems of plants. To obtain it, the surface containing the living plants and their roots, is taken off; the peat is cut by a peculiarly shaped spade into oblong blocks, which are thoroughly dried in the sun; it is then powerfully compressed by hydraulic machines, until its size and weight are reduced nearly two-thirds; next it is ground to powder, and dried in cylinders which revolve in a heated chamber; finally, at a temperature of 180° it is caked by powerful pressure, and is ready for the market. Some of the Michigan farmers use it in preference to wood; its superior cheapness commends it to many others. The *Press* says that it has found a ready sale in Boston and elsewhere. Several peat companies have been formed, and machines invented during the last six months. Peat also gives forty per cent. of illuminating gas, at the rate of about 14,000 feet per ton. The best coal does not equal this. The *Press* thinks that it will become very popular for parlor use, as it can be burned in an open grate, and would be far more cheerful than the dull air-tight stove.

Life of Steel and Iron Rails.

An examination of the steel rails laid down two years and a half since in the Woodhead tunnel of the Manchester, Sheffield and Lincolnshire railway, resulted in a striking illustration of the relative endurance of steel and iron rails. The tunnel is about three miles long, with a station at each end, where trains generally stop, and where the wear of the rails is extraordinary, from the starting of heavy trains with the aid of sand on iron constantly wet with drippings from the roof. The life of an iron rail at these stations was but about five months on one head, and three or four months on the other, after turning. The new rails are 75 lbs. Bessemer steel, double-headed, 2½ inch face, ⅝ in. stem, and five inches deep. Rails were taken out at the places of greatest wear, at each end of the tunnel, and on being carefully measured and compared with the original templates from which they were made, were found to have lost, as nearly as possible, one-eighth of an inch in the thirty months' use under at least eight millions tuns of traffic, as computed from the books of the station. The rails were in admirable condition, and good for five times as much further wear, both heads together; making, in insurance phrase, an "expectation of life," equal to fifteen years, or *twenty times* as long as that of iron.—*Scientific American.*

The Conductive Power of Mercury for Heat.—There are peculiar difficulties in the way of ascertaining accurately the conducting power of mercury for heat; but Professor Gripon, of Lille, seems to have overcome them very successfully, and to have made a determination which may be regarded as very closely approximating to absolute accuracy. It shows the conductivity of mercury for heat to be 407-1,000th of that of lead. Experiments made after Peclet's method shows that if the conducting power of silver is 100, that of mercury is 3.54. Mercury stands therefore, the last of the metals, and a little before marble and gas-coke. It should be observed, however, that the conducting power of this metal for heat and electricity are very different, the former being 3.54, the latter 1.80.

Interesting Experiment.—A sample of pig iron which, after having been re-melted and kept 15 minutes in fusion, bore a strain of 20,336 lbs.; bore, when kept in a state of fusion for 1½ hours 27,456 lbs.; when 4½ hours in fusion, 29,227 lbs.; 6¾ hours, 36,-212 lbs.; and 7¾ hours, 27,512 lbs. the square inch. The density rose form 7175 to the first, to 7343 in the last experiment.

Mining in Australia.—The returns from the gold fields of Australia, for the six months of the present year, compared with the corresponding period of last year, are stated as follows:

	1866. Ounces.	1865. Ounces.
Western Division	60,382	75,424
Southern Division	43,900	60,686
Northern Division	10,032	9,014
Totals	114,323	143,124

Showing a decrease this year of 28,801 ounces, equal to $462 816.

India-Rubber Type.—A manufactory for making printer's type of vulcanized india-rubber has just been started at Dalston. This new style of type is said to be as quickly and easily made, and to be fully equal in quality to the common type, the cost price being only one-third of the latter. It offers the advantage of less weight as compared with metal type, and it can be remodeled when worn. It presents particular advanta, ges for stereotyping. The inventor is an American and is said to be making rapid progress in England.

Singular Fact in Telegraphy.—A correspondent of an English paper, speaking of the Atlantic cable, says that from daylight till 2 o'clock in the afternoon the cable generally works with great difficulty, after which time the working grows easier, and more rapid until dark, and all through the night it works easily and well. The editor of the *Telegrapher* has often noticed this fact on land lines.

METROPOLITAN

GAS STOVE MANUFACTURING COMPANY.

Salesroom, 702 Broadway,

Above Fourth Street, New York.

PATENT GAS HEATING AND COOKING STOVES, RANGES, &c.

SCIENTIFIC GAS HEATING APPLIANCES,

For every known trade or profession.

Patent Petroleum or Aerovapor Stoves. Patent Kerosene Oil Stoves. Patent Portable Vapor Bath Apparatus.

Gas Stoves made by us are constructed under the immediate supervision of A. L. Bogart, Esq., Analytical Chemist and Gas Engineer. They contain recent improvements of a scientific character—by means of which a perfect combustion is obtained, and the Caloric produced, rendered chemically pure. Too much cannot be said against the use of Gas Stoves for heating apartments—when the products of combustion (Carbonic and Sulphurous Acid,) are emitted without purification into the atmosphere. Your Physicians will inform you, that this is a subject of vital importance and worthy of your closest scrutiny—before purchasing. The public are invited to examine into the merits of these inventions.

Every article warranted as represented.

OPPOSITION LINE.

TO CALIFORNIA VIA NICARAGUA,

SAILING EVERY TWENTY DAYS,

With Passengers, Freights, and United States Mails, on the following first class Steamships:

On the Atlantic Ocean,	On the Pacific Ocean.
Steamship Santiago De Cuba.	Steamship America.
" San Francisco.	" Moses Taylor.
" Dakota.	" Nevada.

PASSAGE AND FREIGHT AT REDUCED RATES.

Sailing days from New York.

1866.	December 20th,	January 10th and 30th.
1867.	February 20th,	March 10th and 30th.
"	April 20th,	May 10th and 30th.

And so on at intervals of twenty days leaving on the Saturday previous, when a regular sailing day comes on Sunday.

For further information, apply at the Company's office, 177 West-st. corner Warren-st. N. Y.

66tf D. N. CARRINGTON, Agent.

BAY STATE FIRE-BRICK AND CLAY RETORT WORKS.

CHELSEA, MASS.

DAVIS & CHADDOCK,

MANUFACTURERS.

Office Nos. 125 and 127 Water-st., Boston.

Also agents for the sale of J.K. BRICK & Co's, Clay Retorts, Fire-Brick, Gas-House tile, etc. 66tf

THE

WASHINGTON MILL

AND

SILVER MINING COMPANY

OF ECHO DISTRICT, HUMBOLDT CO., NEVADA.

Capital Stock $300,000,

Issued for Mining Purposes.

60,000 Shares at Five Dollars each.

OFFICERS:

President—J. Clements Stocker.
Vice-President—John J. Thomas.
Secretary and Treasurer—Henry Lee Reynolds.
Superintendent—William S. Sargent.

TRUSTEES:

J. Clement Stocker, New York City.
John J. Thomas, New York City.
Lewis W. Phillips, New York City.
E. Page Davis, Unionville, Nevada.
Henry Lee Reynolds, New York City.

Office of the Company, 30 Pine street, New York.

☞ The Mine of this Company rapidly approaching that point of development which will necessitate the erection of a Mill, the Trustees are authorized to dispose of 10,000 shares of the reserve capital stock.

Sealed Tenders will therefore be received at the office of the Company, 30 Pine street, Room 4, till December 20th, 1866, at noon. The Officers of the Company reserve the right to reject all bids under par.

FOR SALE.

THE VALUABLE IMPROVEMENT FOR Saving and otherwise improving the Gas, invented by Dr. J. S. Wood, described in the "Gas-Light Journal" October 2d, 1866, is now for sale by State or County rights.

Address J. S. Wood, Patentee, No. 400 Liberty st. Philadelphia, Pa.

J. FIRMIN,

Gas Fitting and Plumbing

Nos. 64 & 66 Maiden Lane, cor. William-st.

Residence, No. 1147 Broadway, near 26th-st.

HOUSES FITTED UP WITH PLUMBING AND GAS WORK IN THE MODERN AND IMPROVED STYLE. SEWERS CONNECTED. BRASS AND LATHE WORK. JOBBING IN ALL ITS BRANCHES ATTENDED TO WITH PUNCTUALITY AND DISPATCH.

GAS BILLS REDUCED.

Gas Lights perfected upon New and Unerring Principles.

REFERENCES:

At A. T. Stewart's the gas-lights were improved and the gas bills reduced one-third, amounting to several thousands of dollars per year.—A. O. Willcox, No. 40 Wall-st.

At the Tribune Association gas bill reduced upwards of one hundred dollars per month, and better lights given.—Samuel Sinclair, Publisher.

At H. B. Claflin's, late Claflin, Mellen & Co., gas bill reduced—amount not yet ascertained—but it will be at the same ratio, as light improved.—Mr. Bancroft.

At Wm. Schieffelin & Co.'s, corner William and Beekman-sts. good light obtained and maintained at all parts of the premises without additional cost—a result despaired of even by the Gas Co. owing to the deficiency of supply. No deficiency by Firmin's system.

Similar results guaranteed under similar circumstances, or NO CHARGE. 63-68

EMPIRE LINE

FOR SAVANNAH, GEORGIA,

Every Saturday, the elegant Side-Wheel Steamships

SAN SALVADOR,

Commander, Joshua Atkins, and

SAN JACINTO,

Commander, Winslow Loveland.

Every SATURDAY, from pier 13 North River.

Have been placed on the route to Savannah by the Atlantic Mail Steamship Company of New York, and are intended to be run by them in a manner to meet the first class requirements of the trade.

The cabin accommodations of these ships are not excelled by any Steamers on the coast, and although their carrying capacity is large, their draught of water enables them to insure a passage without detention in the river

San Jacinto,	Saturday,	Oct.	6	San Jacinto	Saturday,	Nov.
San Salvador,	..	"	13	San Salvador	..	"
San Jacinto,	..	"	20	San Jacinto	..	"
San Salvador,	..	"	27	San Salvador,	..	"

Returning, leave Savannah every Saturday at 3 o'clock, P. M.

Bills of Lading furnished and signed on the Pier.

For further particulars, engagement of Freight or passage, apply to

GARRISON & ALLEN, Agents,
No. 5 Bowling Green.

Agent at Savannah, B. H. HARDEE.

Gas Fixtures and House Furnishing GOODS,

E. V. HAUGHWOUT & CO.,

488, 490 and 492 Broadway.

Corner of Broome street, New York,

Mannfacturers and dealers in

CHANDELIERS & GAS FIXTURES

Have a large and very choice assortment of GAS FIXTURES, which they offer at reduced pri ces, in view of the recent fall in gold. Their

Glass and Fire Gilt Chandeliers, are of entirely new designs,

And well worthy of attention by those who wish to purchase

☞ *Fine Fixtures for their Houses.*

OFFICE OF WM. DAVIDSON, INSPECTOR OF GAS METERS FOR THE STATE OF NEW YORK.

☞At the above address.

Architectural Iron Works,

13*th and* 14*th streets, near Avenue C.*

BRANCH OFFICE 42 DUANE ST., *NEW YORK.*

OFFICERS: { D. D. Badger, President. N. Cheney, Vice Pres. & Act. Tr. C. C. Gordon, Secretary Pro Tem.

PRODUCTS:

Iron and Fire-Proof Buildings, Iron Fronts, Rolling Shutters, Roofs, Domes, Bridges, Railings, Verandahs, Balustrades, Stairs, Cornices, Columns, Capitals, Arches. Window Lintels and Sills, Consoles, Brackets, Rosettes, Urns, Door and Window Guards, Lamp, Awning and Horse Posts, Venetian Blinds, Patent Lights, Iron Side Walks, Rolled, Riveted and Cast Iron Beams and Girders, and all Architectural and General Iron Work.

H. M. BAILEY, Superintendant of Works.
J. WALTER CLARK, Accountant. J. M. DUCLOS, Arch.

OREGON IRON FOUNDRY,

738, 740, 742 and 744,

Greenwich Street, New York.

CASTINGS FOR

GAS WORKS

OF ALL DESCRIPTIONS, INCLUDING

Purifiers, Exhausters, Compensators, Self-Acting Valves, Branches, Bends, &c.

FLOYD'S PATENT

Malleable Iron Retort Lid.

SABATTON'S PATENT

Furnace Door and Frame.

Refers to—J. A. Sabatton, Esq., Engineer Manhattan Gas Co.—Col. A. J. White, Metropolitan Gas Co.—C. C Mowton, Engineer New York Gas Light Co.—J. Mowton Saunders, Engineer Baltimore Gas Co.—John T. Harrison, Engineer Savannah Gas Co.

135] HERRING & FLOYD, Proprietors.

SILAS C. HERRING. JAMES R. FLOYD

KEROSENE

Cooking Apparatus.

All the cooking for a family can be done with Kerosene Oil, with less trouble and at less expense than by any other fuel.

Our stoves give no smoke or odor, and are not liable to get out of order, being as simple in every respect as a kerosene lamp. The Baker, Boiler, and Flat-Iron Heater are the only special articles of furniture required. For all other purposes, ordinary stove furniture may be used.

We would call attention to the fact that for the past three years, the Company has devoted itself almost exclusively to the manufacture of Kerosene Cooking Apparatus, and is prepared to guarantee that every article shall perform all that is claimed for it.

Liberal discounts to the trade. Send for circulars and price list.

KEROSENE LAMP HEATER CO.,

206 Pearl Street,

NEW YORK.

THOMAS CASSIDY,

Iron Founder & Pattern Maker

Corner Hudson and Park Avenues,

BROOKLYN.

Iron Store Fronts put up at short notice.

Square and Round Columns, Truss Girders, Vault Beams, Window Lintels, Sills, &c.

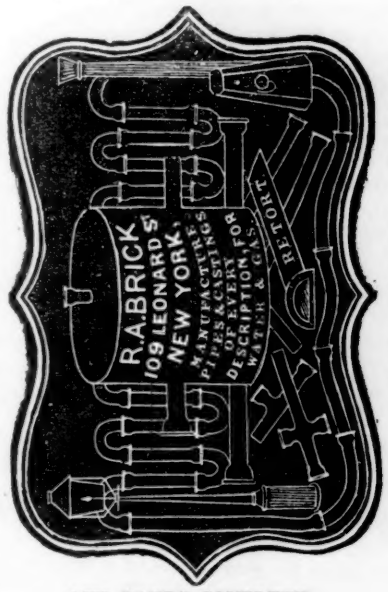
A large assortment of Railing Castings constantly on hand, or made to order, at the shortest notice.

Lamp Posts—Brooklyn Pattern.

☞A large stock of the usual sizes of Round Columns kept on hand.

DRIVING PIPE,

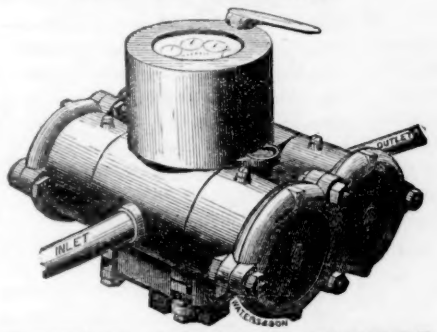
BERGEN IRON WORKS,



OFFICE 109 LEONARD STREET, NEW YORK.

AND BANDS COMPLETE.

H. R. WORTHINGTON'S



PATENT WATER-METER.

This Meter is also used for the measurement of Oil —it combines

ACCURACY, SIMPLICITY, and REMARKABLE DURABILITY with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.

HENRY R. WORTHINGTON,
61 Beekman steet, N. Y.

WILCOX & GIBBS' SEWING MACHINE.

It is entirely noiseless. A patented device prevents it being turned backward. The needle cannot be set wrong. It received the gold medal of the American Institute in 1863. Send for a circular containing full information, notices from the press, testimonials from those using the machine, &c.

JAMES WILCOX,
Manufacturer, 508 Broadway, New York.

PRINCIPAL OFFICES:

NEW YORK—508 Broadway,	HAMBURG—44 Herman-st
BOSTON—323 Washington-st.	PARIS—82 Boulev'rd d Sebastopol
PHILADELPHIA—720 Chesnut-st.	ST. PETERSBURGH—15 Gorochovay
CHICAGO—133 Lake st.	VIENNA—9 Wildpretmarket.
CINCINNATI—80 West 4th-st.	BRUSSELS—12 Rue Croisade.
LONDON—135 Regent st.	SYDNEY, Australia—212 Pitt-st.

Mining & Petroleum Standard

AND

AMERICAN GAS-LIGHT JOURNAL,

Published on the 2d and 16th of Each Month

At No. 22 Pine Street, New York.

BRYANT, CALLENDER & CO.,

EDITORS AND PROPRIETORS.

Profs. PARTZ & BUCK, Consulting Chemists.

WEDNESDAY, JANUARY 2, 1867.

WISHING TO MAKE this Journal an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its colums are devoted, the publishers solicit letters from all among them who make the study of those subjects a pleasure, or a profession.

CONTENTS.

Thompson's Improved Gas Controller, Illustrated, ..	193	Auriferous Ores and Sodium Amalgam.....	196
The Koller Quartz Mill, Illustrated,.....	193	Correspondence.....	197
On the Combustion of Gas for Ecomonic Purposes,...	194	Explosion at the Astoria Gas Works	197
Singular Molecular Changes,	194	Miscellaneous Items.....	197
A Mineral Belt,.....	194	Pent in Michigan	198
The Process of Roasting Ores	195	Life of Steel and Iron Rails,	198
Steel Rails, ...	195	To our Patrons and Readers.	200
A Powerful Source of Artificial Light.....	196	Culmination of the Gas Question.....	200
Lecture and Experiments by Professor Doremus.....	169	Knight & Woodward's Cement Pipe Manufactory..	185
		New Books.....	201

To our Patrons and Readers.

We greet you very cheerfully with the "compliments of the season," because we look over the past year and see inscribed upon the pages of our Jonrnal, PROGRESS, and we look at the present condition and future prospects of it, and we find SUCCESS is inscribed upon its escutcheon.

We thank many of our patrons for indulgence, because we have not devoted the attention to their especial interest which was due them. In the Mining, Petroleum, and Gas departments, we think very valuable intelligence and scientific information has been published by us. Some of our gas patrons have thought we were ignoring the subject of gas for these other matters. We do not think so, and upon reference to our gas articles and compilations of whatever information we have deemed worth publishing, there is an aggregate of knowledge and experience not to be disregarded or deemed to be without value by them.

Numerous new plans for improvement in generating gas from coal—suggestions for carburretting gas—machines for making illuminating gas with the vapor of a volatile oil in connection with atmosphere, *et. cetera* are frequently presented to us for a notice in commendation, but we must have more than a model and a theory to influence us; we must *know* the practical working of the plan before endorsing it. For some time past very valuable improvements in generating gas from coal have been, and are now under practical illustration, and so soon as we have permission from the parties in interest, the Journal will give the details to its readers. A very few such articles as we have published and shall continue to, we think should satisfy our gas subscribers. It is to the water department we have been recreant, and are gratefully surprised that our hydraulic friends have not "stopped" the Journal. Not one, however has done so, and we now *promise* to make amends before this volume closes (July 1, 1867).

We wish our patrons and readers "A Happy New Year," and thank them for so well supporting our enterprise.

To our contemporaries and exchanges we extend most cordial salutations, and to the press at large our respectful regards.

To our contributors and counsellors—especially to Professor Henry Wurtz, Professor John H. Tiemann and Professors Partz and Buck, we wish to express our grateful acknowledgements.

JAMES W. BRYANT,
MILLS L. CALLENDER,
EDITORS

Culmination of the Gas Question.

We have been sometimes amused and at other times annoyed by the propositions suggested for the relief of oppressed gas consumers (so called). The outrage (so called) has at last reached such huge proportions that a remedy is required, and the *Herald* says will be soon provided, whereby gas consumers can be supplied with gas at "one quarter its present cost." Grand consummation of ridiculous and absurd propositions! The *Herald* with its "mysterious influence" has learned that "a great revolution is about to take place in the method of supplying gas in all the cities of the Union." *One company* is to supply the Atlantic and interior Northern cities from the mines of Pennsylvania, and another company supply the Southern cities and towns from the mines of Virginia and North Carolina! Hitherto we have thought the *Herald* was possessed of a good deal of common sense, and would not notice propositions which upon a moment's reflection, would be known as preposterous, without proper comment.

We have not lately noticed the proceedings of meetings held to correct the impositions (so called) of gas companies, and the numerous suggestions from editors of newspapers in reference to gas matters, about which they are perfectly ignorant in detail, because we have known they would end in the futile results they have. Some may claim that by their action the Manhattan Gas Company were prevented from being permitted to charge more than $2.50 per 1000 cubic feet for their gas, although at the time of the application of the company for that permission from the Legislature, good illuminating gas could not be supplied to consumers at so low a cost as $2.50 per 1,000 feet.

We wish to believe that the objection of the Governor of the State to this relief asked, was based upon the fact of their charter confining them to $2.50 per 1,000 feet, rather than an unwillingness to give an important institution a fair commercial *status* in the community, with other institutions of the same character. As an abstract proposition we hold that there is no inherent right in municipal authorities to regulate the price of illuminating gas—unless by agreement with a company when a charter or franchise is granted—any more than for tallow candles, kerosene oil, or any other illuminating article. The coal market fluctuates so that companies are sometimes made wealthy or bankrupt in a season. So with iron and other branches of large business. Especially have we observed operations in the West, where millions of dollars in a month have been made or lost. Can we, should we therefore legislate upon pork merchants invidiously, and because they realized fortunes in past years, impose restrictions upon them at a time of misfortune, because they had been successful before? Now of all investments made in commercial or social enterprises—for gas companies are frequently organized for social comfort—most of them pay better than gas companies in general. There are nearly 600 gas works now erected in the United States, the cost of which approximates to $40,000,000. Not more than one quarter of these companies pay a fair dividend, and the greater number of the other three quarters do not much more than pay expenses, and some are actually carried on by the stockholders for the *luxury* of enjoying gas light, while others are lying idle.

Now, we assume that gas light is as much an article in the market for consumers as candle light or kerosene oil light. Consumers are not *obliged* to buy gas light, and we assume that if they are not willing to pay for it that they can buy some other kind of light, and not grumble continuully *about the price charged for gas.* Our proposition is this, that companies should be *obliged* to supply *a good illuminating gas* not less than 14 or 15 candle standard. *The price would regulate itself,* and would do so upon fair terms. The gas companies are desirous to sell large quantities of gas, because the more they manufacture the less the average cost is to them. In small works the price is necessarily high.

We have observed lately some articles against the Citizens Gas Company of Brooklyn in the Brooklyn *Eagle,* which elicited a reply from W. P. Libby, Esq., the President of the company. We publish the letter only, not having space for the articles in the *Eagle,* and it is sufficient, because Mr. Libby's letter is explanatory of the whole subject, and to any impartial person his argument so clearly made, will be conclusive upon the question at issue.

We have also observed a proposition made by a well meaning member of the Brooklyn Council, to take the gas works into the hands of the corporation! To argue this proposition would be to insult the good sense of that intelligent body of men, because they, and the member himself who proposed it, upon reflection and correct information, will understand its impracticability and the exceedingly deleterious public and political influences which would result from it.

All this great hue and cry about extravagant charges for gas light is absurd. There is not a head of a family who uses gas light any where, who does not expend more money per month for segars, tobacco, liquor, or other luxury, than his gas light bill amounts to, and the luxury of gas light is the greatest luxury enjoyed in a family. Now let us calculate the expense—say one common burner consumes five cubic feet per hour, and gives a light equal to fourteen sperm candles; put the price of gas at $5 per 1,000 feet, and the expense for that one five foot burner giving a light equal to fourteen sperm candles of the size six to a pound, will be two and a half cents per hour!

We are not influenced by "fear, favor or affection" in the expression of our sentiments or opinions upon this mooted subject; but we feel it a duty once in a while at least, to state some facts about gas companies which consumers are not aware of, that a better understanding may be had between them than now exists. We are not the organ for gas companies, to speak in their favor untruthfully, any more than we would for any of our other patrons, and, so far as the patronage of the gas companies is concerned, although almost every gas company in the United States of any importance subscribes to our journal, it constitutes but a small part of our income from the journal.

And now a few words more for the *Herald* on the "great gas explosion."

To supply sufficient gas to illuminate the cities of New York and Brooklyn from the nearest mine of gas coal in Pennsylvania, would require a main pipe large enough to drive a stage-coach in, and the pressure which would be necessary at the mines to force the gas into the service pipes of the houses would be strong enough to drive most of it through the pores of the iron, before it reached its destination. It is, perhaps, a good joke for the *Herald,* because there are many persons of general intelligence who are ready just now to believe anything, no matter how absurd or unjust, which may be said against

gas companies and about their extortions and impositions. Simply *insist upon having good illuminating gas*, and we shall find that *we can endure paying for it.*

A Card from the President of the Citizens Gas-Light Company.

Office of the Citizens Gas-Light Co.,
Brooklyn December 11th, 1866.

To the Editor of the Brooklyn Eagle:

The Eagle of yesterday contains an elaborate and acrimonious attack upon the Citizens Gas-Light Company—its management and its directors. It is, of course, not to be expected that a company shall enter upon its defence upon the occasion of any unfavorable allusion to their affairs which may appear in the newspapers, but there are times when the position and relations of a company are so entirely misunderstood that an explanation becomes due to themselves as well as to the public. Perhaps your article fairly presents such an occasion, and that it is incumbent upon me to embrace it for the purpose of stating such facts as will be likely to result in a clearer and more satisfactory understanding between our consumers and ourselves.

Your article contains no facts or data of any description to show that we are charging an exorbitant and unreasonable price for gas. You set up the price charged by the Brooklyn Company as a standard, and subject us to your unqualified condemnation because our price is somewhat greater than theirs. This can scarcely be considered a fair rule—at all events if we are to be brought under suspicion because our prices are somewhat higher than those of the single company you have named, we have a right to claim a vindication by a comparison with companies you have not named. The New-York Gas-Light Company occupying a densely populated territory in the city of New-York, and having with a smaller area four times as great a consumption as the Citizen's, charge $3 50 per thousand feet. The Metropolitan Company, also of New-York, with a consumption double that of ours, charge the same price; while the Manhattan Co., with a business larger than that of any other company in the United States and perhaps in the world, being limited in their charter to $2 50 per thousand, and by charging Government tax and meter rents, in addition thereto, has, I am informed, for two years past, paid only a single dividend of five per cent.

The Williamsburgh Company, occupying the Eastern District of the city, and whose business approximates to that of the Citizen's, charge $4 per thousand, and without complaint from the local press as far as we know.

The City of Philadelphia, with the design of furnishing gas to its citizens at the lowest price without profit, have charged $3.15 per thousand, and at that price there has been a deficiency in that department of $200,000 in a single year, as appears by a report made upon the subject to the Common Council of that city. It is to be observed that they furnish an amount eight times greater than the Citizen's, and have also an advantage of some $2 per ton in the price of coals. The prices above stated will be found generally to apply to all of the principle cities of the United States. [See statement appended.]

That their prices are not unreasonable will appear from the following statement of the facts: Before the war, gas was sold in Brooklyn, as well as in other large cities, at an average of about $2 50 per thousand feet. The cost to-day of all the principal ingredients which enter into the cost of the manufacture of gas, such as coal, iron pipes, labor, are, on the average, 70 per cent. higher than before the war. If the price of gas should be increased in the ratio of the increase of the cost of production, it would now make a price of $4 25 per thousand feet, exclusive of the Government tax. It is a fact, and will doubtless be admitted, that in almost every article of necessity or convenience used by the community, such as flour, beef, coal, newspapers and every species of manufactured goods, the price to the consumer has been increased much beyond the increased cost of production. This is not generally complained of because by usage almost everything now has become, with reasonable exactness, adjusted to this new and increased scale, and it does seem mysteriously strange that in the single article of gas, the price of which is under rather than above the general ratio of increase, there should be such a loud and persistent clamor. Is everybody to be ruined because the cost of gas is measurably increased with all other things? and are gas companies to be continually assailed as extortionists, and made the special objects of popular distrust and suspicion? Are you aware Mr. Editor, that you charge three times as much for the Eagle as before the war? How can you explain this satisfactorily to a suffering public?

But to return to the main point of your article, namely, that our price is higher than that of the Brooklyn Company, it is proper to observe, what indeed, must be almost self-evident, that the circumstances of the two companies, the territory in which they operate and the amount which they supply, may be so difierent that the one cannot be the proper standard for the other in the matter of price. A large portion of the territory of the Citizen's Company, for instance, is sparsely populated. Yet nevertheless the people desire that gas should be brought to their doors. The Citizens' Company during the last two years have laid about 50,000 feet of mains in the outskirts of their district. It has not been profitable to the company to do this, but it has been demanded by the public, and is beneficial to their interests. The consumer in the populous portions of the district must for a time bear a part of the burden which is assumed in extending the facilities to the remoter sections. I think I can safely say that the Brooklyn Company has not within the period named laid one-third of this amount of mains. And when this is understood, it seems to me that no further explanation need be necessary to account for the difference in the charges of the respective companies.

This difference is probably temporary, and it is not likely when the conditions of the two companies approximate, that their charges will be widely different.

But I have already extended this communication beyond my intention. It is not practicable within the space that I could expect you to allow me to treat this subject in all its aspects. You have a newspaper in your hands in which you can daily assail us, and it will not be practicable for me to follow you with replies. You may think that you are serving the public. I think that you are destroying that credit and confidence which it is so desirable should exist in the community. The public already feel that a corporation should be their servant, their absolute slave even, and fail entirely to deal with a company upon the same principles of justice and right which is always expected to be maintained between individuals.

I will only add that the matter of reducing the price of gas has been for some time under consideration by the directors of the company, and that such reduction will be carried into effect as soon as circumstances will permit. W. P. Libby, President.

P. S.—The net prices per thousand feet charged private consumers in the following cities, as appears from an official document, including government tax, is:

New-York	$3 66	Chicago	$3 80
Jersey City	4 00	St. Louis	4 27
Albany	3 75	Baltimore	3 30
Buffalo	3 50	Washington	4 10
Cincinnati	3 33	Boston	3 25
Louisville	3 33		

W. P. L.

Knight & Woodward's Cement Pipe Manufactory.

Our readers will find on our last page an engraving of a prominent New-York and Brooklyn establishment, for producing one of the most valuable articles known in manufacture, for house and street uses.

The use of hydraulic cement and concrete formed with it is, of late years, beginning to assume its proper rank in construction, and in process of time will supersede, as it did in the palmy days of Roman history, the unreliable substitutes which have been too long accepted in its place. This firm have carried the details of pipe manufacture to great perfection, so as to produce pipes of various forms, diameter and length, with entirely symmetrical lines and *hub* joints, made of the best cement and *clean* sand; the material sets rapidly, and then continues to crystallize for indefinite periods.

For house drainage and city sewerage, these pipes have been largely used, as in Brooklyn, Central Park, New-York, Jersey City, Elizabeth, Albany, Hartford, Bridgeport and various other places; for railroad culverts, their superior convenience, efficiency and economy have led to their extensive adoption, as on the Delaware and Raritan Bay, Athens and Saratoga, South side of Long Island, North shore Long Island, Montgomery and Erie, and Middletown and Unionville Railroads, Orange County, New York, and other railroads; and their superior forms and quality have elicited the approval of various hydraulic engineers, who have become by practice familiar with the defects of stoneware pipes, which are liable to warp and crack in baking, and understand the necessity of a thoroughly tempered and carefully prepared morter in the concrete materials from which the pipes are moulded. Probably in practice the manipulation of hydraulic cement and its concrete, was never carried to a nicer grade of perfection than in the processes adopted, after long investigation, by Mr. Knight, under whose patents these pipes are made.

New Books.

A Manual of Zoology for Schools, Colleges, and the General Reader. Sanborn Tenney, A. M.: Charles Scribner & Co., Publishers, 654 Broadway, New-York.

This is a valuable and instructive work, peculiarly adapted and arranged so as to be attractive to the general reader as well as the scholar, containing over five hundred engravings of animals, birds, reptiles, fishes, &c., superior in artistic style and finish, while the typography is in excellent taste to correspond. The author of this work is Professor of Natural History in Vassar Female College.

We can commend this work generally, and particularly on account of its accuracy and because it treats upon the late discoveries and classification in natural history.

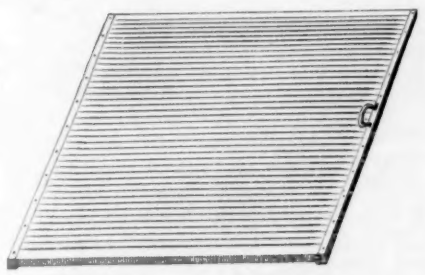
☞ Patent Butter Packages.—We have on our desk a new article in which to pack butter for family use. It consists of a neat cylindrical wooden box with stout heads not unlike a fig box, but having the property of extension like a telescope, to accomodate a less or greater amount, from 2 to 5 or 10 pounds of butter etc. It is also varnished with a preparation of paraffine which is perfectly impervious to air and moisture, and entirely innocuous to the contents.

There is no doubt this will become a very popular article for packing butter, lard, etc., so that the contents are not disturbed until used and necessarily keeps as fresh and sweet as when put up at the dairy.

Messrs. Gurnsey & Dyer of Norwich. N. Y., are the manufacturers of these useful articles.

☞ Reduction in price of gas by the Citizens' Gas Company of Brooklyn to $3 25 per thousand ft. The *Brooklyn Eagle* claims the credit of it. We were aware before the first article was written in the *Eagle* that a reduction was intended. The importance and value of a paper which will fairly represent the public cannot be too highly appreciated, and the "Eagle" professes to do so. It certainly seems desirous to protect the interests of the public

☞ The advertisement of Messrs. Knight & Woodward, having been handed in very late for the last number, our editorial was written and set up in a hurry and some typographical errors committed, therefore we re-publish it.



JOHN L. CHEESMAN,

MANUFACTURER OF PATENT CONICALLY SOLID WOOD TRAYS.

Two hundred per cent. cheaper than Iron and will last twice as long.

☞ All persons are cautioned against purchasing of any other person. Orders received by mail, or otherwise.

JOHN L. CHEESMAN,
147 and 149 Ave. C., New York City.

ALBERT C. KUCK,

Manufacturer and Dealer in

COAL OIL

LAMPS,

CHIMNEYS,

BURNERS,

WICKS,

SHADES,

BRACKETS,

AND

CHANDELIERS

In all varieties and at manufacturers' prices.

AGENT FOR THE CELEBRATED

"Eureka" and "Nonpareil" Lanterns.

FRUIT JARS OF ALL KINDS AND SIZES.

57 FULTON STREET, NEAR CLIFF St.,

NEW YORK.

F. H. LOVELL & CO.,

Successors to Alfred Bliss & Co.

MANUFACTURER AND JOBBERS OF

KEROSENE

LAMPS

CHANDELIERS,

BRACKETS,

AND

Lamp Trimmings

GENERALLY.

Station, Sugar House, Street and Coal Oil Lanterns.

No. 233 Pearl Street,

159-182 *NEW YORK.*

Illustrated catalogues and price lists furnished on application.

NEW YORK LAMP COMPANY,

259 Pearl Street, New York.

We Would call especial attention to our recently improved

UNION BURNER,

which now burns without SMOKE OR ODOR. With Coal or Petroleum Oil makes the cheapest light known,

One Cent for Eight Hours.

The improved Union Burner without chimney, for a hand or portable night lamp is unrivalled.

Patented in the United States, England, France and Belgium.

NEW YORK LAMP CO.,

58 259 Pearl-street, near Fulton, New York.

Something New and Useful.

A POCKET LANTERN, which, when folded, occupies the space of a cigar case, and when open gives a good light. The most convenient article for any one who is liable to be out at night. Sample sent by mail on receipt of one dollar.

Address

NEW YORK LAMP CO.,

57 259 Pearl-street, New York.

The Aladdin No-Chimney Burner

GIVES A BRILLIANT LIGHT WITHOUT THE use of a chimney. Fits on to almost all kerosene lamps. It is the best no-chimney burner made, and no family should be without them. Samples sent by mail on receipt of 50 cents.

Address

NEW YORK LAMP CO.,

57-62 259 Pearl-street, New York.

R. L. DELISSER & CO.,

DEALERS IN MINERAL LANDS

—AND—

PATENT RIGHTS,

No. 69 Beaver St., NEW YORK.

152-176

WILLIAM ELTING

Manufacturers Agents for the Sale of

PORTABLE AND

Stationary Steam Engines,

BOILERS AND MACHINERY,

No. 65 Liberty-St, NEW YORK.

☞ Leather and Rubber Belting supplied at usual rates. Circulars sent on application. 55-78

MOREY & SPERRY,

Manufacturers of

HEPBURN & PETERSONS, AND BEATH'S

Amalgamators, Stamp Mills,

Quartz Crushers, and other

MINING MACHINERY.

ALSO AGENTS FOR

Foundries in San Francisco, Cal., and are prepared to make time contracts to erect Mills completed, on the premises in California, Nevada and other Territories.

Office No. 95 LIBERTY ST., Rooms 10 & 11.

152-176 **New York.**

A. HITCHCOCK,

Inventor and Manufacturer of the

Cam Quartz Breaker and Pulverizer,

REVERSIBLE ROLLER MILL,

IDAHO MILLS & AMALGAMATORS,

Adapted to All Kinds of Power.

Unequalled for utilizing power—avoiding friction and wear,—rapidity of work, and facility of transportation and adjustment. Also, **Hitchcock's Adjustable Tubular Flue-cleaning Boiler,** and other valuable Patents, for which license to manufacture will be granted on reasonable terms.

Circulars furnished on application.

53-76 *Office No. 4 & 6 Pine Street, New York.*

GEO. H. BRONSON,

132 Maiden Lane, New York,

Dealer in

Paraffine Machinery Oil,

From PURE CANNEL COAL, adapted to all classes of

Stationary Machinery,	Woolen Factories,
Locomotive Engines,	Cotton Spindles,
Railroad Cars,	Sewing Machines, &c.

Paraffine Wax and Paraffine Wax Candles. Also the best brands of Burning Oils. All Oils guaranteed to answer the purpose for which they are recommended.

57 80

D. B. GRAY,

DEALER IN ALL KINDS OF

INDIA RUBBER GOODS

Vulcanized Machine Belting,

Conducting, Hydrant, and Engine Hose,

GUM STEAM PACKING,

Amidon's Improved Clothes Wringer,

And all kinds of Useful and Fancy Rubber and Vulcanite Goods,

No. 201 Broadway,

Middle of the Block between Fulton and Dey Streets, NEW YORK.

WILLIAM S. CARR & CO.,

Successor to Sawyer & Co.,

SOLE MANUFACTURERS OF

Carr's Patent Water Closets,

URINAL VALVES, &c.

Also Manufacturers and Dealers in PLUMBING MATERIALS OF EVERY DESCRIPTION, Plumbers' Brass Works, Earthen Ware, Pumps, Iron Drain Pipes, Trays and Sinks, Copper Bath Tubs, Showers, &c., &c.

OFFICE AND MANUFACTORY

149, 151, 153, 155, 157 Centre Street, cor. Canal,

NEW YORK.

Illustrated Catalogue and Price List sent on application.

152-176

CHARLES H. REICHMANN,

Manufacturer and Jobber of

LAMPS,

Petroleum Stoves, &c.

AND IMPORTER OF

Porcelain Shades,

WICKS, &C.,

No. 45 Fulton St.,

[Bet. Pearl and Cliff]

NEW YORK.

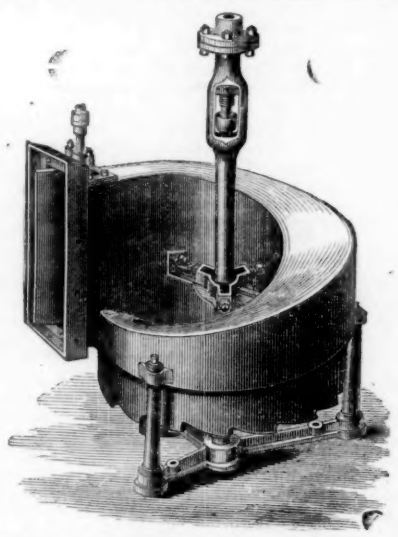
ALL ORDERS promptly filled for his Patent Petroleum Stoves or Lamp Heaters, which are acknowledged to be superior to any other article of the kind now in use, as regards economy in consumption of oil, as well as simplicity of construction.

These Cooking Apparatus are used like any coal oil lamp, being provided with a sheet metal chimney, in consequence of which they burn without odor or smoke. They radiate no heat into the room, and are therefore very desirable in hot weather.

Also, Nursery and Night Lamps combined, a superior and cheap article for nursery or sick room; has a kettle, cup and pan, complete.

STEVENSON'S

Helical Jonval Turbine Water Wheel,



For first-class mills and factories where great economy of wate and simplicity and durability are required.

Manufactured by the Patentee,

J. E. STEVENSON, Hydraulic Engineer,

40 Dey Street, New York,

☞ Stevenson's Jonval Turbine Water Wheel gave the highest per centage of power over all others at the trial of Water Wheels at Fairmount Works, Philadelphia, March 9th, 1860. NINETEEN WHEELS WERE TESTED. The only practical test on record.

PORTABLE CIRCULAR SAW MILLS

With STEARN'S PATENT SETS, far superior to Rack and Pinion and Screw sets. Years of wear will not cause lost motion. All plank sawed with perfectly even thickness. No time lost in setting. Suitable for sawing any kind of Lumber and Timber.

SUPERIOR MULAY MILLS

With the latest improvements, at reasonable prices.

Steam Engines and Boilers

Especially adapted to lumbering purposes.

FOR SALE.

PORTABLE FLOUR AND GRIST MILLS.
WATER-WHEEL GOVERNORS.
ROTARY HAND AND POWER PUMPS.
RUBBER AND LEATHER BELTING.
CIRCULAR SAWS.

53-76

J. H. TIEMANN.

ANALYTICAL CHEMIST,

Metallurgist & Mining Engineer.

240 PEARL ST. Cor. BURLING SLIP, N. Y.

tf

MANHATTAN

Fire Brick & Enamelled Clay Retort Works,

MAURER & WEBER,

(Of the late firm of B. Kreischer & Co.)
PROPRIETORS.

Office & Works in 15th street, Avenue C,

MANUFACTURERS OF

Fire Brick and Tiles,

OF ALL SHAPES & SIZES,

Fire Mortar, Clay and Sand.

☞Articles of every description made to order, at short notice. (135

HY. MAURER. ADAM WEBER.

NEW YORK

Fire Brick and Clay Retort Works

☞ *Established in* 1845, ☜

(Branch Works at Kreischerville, Staten Island,)

B. KREISHER,

Office 56 Goerck St, cor. Delancey, New York.

GAS RETORTS, TILES and FIRE-BRICK of all shapes and sizes.
FIRE MORTAR, CLAY, and SAND.
Articles of every description made to order at the shortest notice.
B. KREISCHER.

J. K. BRICK & Co,

BROOKLYN CLAY RETORT,

—AND—

FIRE BRICK WORKS,

VANDYKE STREET, BROOKLYN, N. Y.

JOSEPH K. BRICK, EDWARD D. WHITE.

J. H. GAUTHER & CO.,

MANUFACTURERS OF

Gas Retorts, Tiles and Fire Bricks,

Black Lead Crucibles, and Carburet of Iron Stove Polish,

JERSEY CITY, N. J.

Refer to—Manhattan Gas Light Co., New York. [135

Philadelphia Fire Brick Works,

Corner of Vine and Twenty Third sts., Philadelphia,

JOHN NEWKUMET,

Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

PRINCE'S METALLIC PAINT.

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though said at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, ouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Five Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agent—CALVIN GAY, 29 Federal st., Boston.

AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS

At prices within the reach of every Church, School, Cemetery, Factory, or Farm in the land. Their use throughout the United States and Canadas for the past six years has proven them to combine most valuable qualities. Among which are TONE, STRENGTH, SONOROUSNESS, and DURABILITY OF VIBRATION, unequalled by any other manufacture. Sizes from 15 to 5,000 lbs., costing TWO-THIRDS LESS than other metal, or 25 cents per pound, at which price I warrant them twelve months. Old bell metal taken in exchange, or bought for cash. Send for a circular to the manufacturer,

JOHN B. ROBINSON,
No. 36 DEY STREET, NEW YORK.

List of Academy, Steamboat, Fire-alarm, and Church Bells, with particulars as to Weight, Sizes, Price of Bells, Hangings, etc.

Weight of Bells.	Diameter.	Price of Bells without Hangings.	Price of Patent Hangings.	Price of Bell and Hangings complete.
225 lbs.	26 inches.	$56 00	$15 00	$71 00
275 "	42	69 00	18 00	87 00
375	36	94 00	22 00	116 00
450	84	112 00	25 00	137 00
600	02	150 00	30 00	180 00
750	39	188 00	35 00	225 00
1,000	64	250 00	42 00	292 00
1,200	48	300 00	45 00	345 00
1,400	50	350 00	50 00	400 00
1,600	52	400 00	54 00	454 00
1,800	55	450 00	60 00	510 00
2,000	58	500 00	62 00	562 00
2,500	60	625 00	72 00	697 00
3,000	63	750 00	85 00	835 00
3,500	66	875 00	87 00	962 00
4,000	69	1,000 00	100 00	1,100 00
4,500	72	1,125 00	118 00	1,258 00
5,000	75	1,250 00	125 00	1,375 00

List of Prices, Weights, and Sizes of Farm, Hotel, Steamboat, Schoolhouse, Shop, and Factory Bell.

These Bells are fitted with Yoke, Standard's Crank and Bolt, complete for use.

Weight of Bell and Hangings.	Diameter.	Cost of Bell and Hangings complete.
15 lbs.	7 inches.	$3 75
20	8½	5 00
35	10	8 75
50	12	12 50
75	16	18 75
100	18	25 00
150	20	37 50
200	22	50 00
250	24	62 50

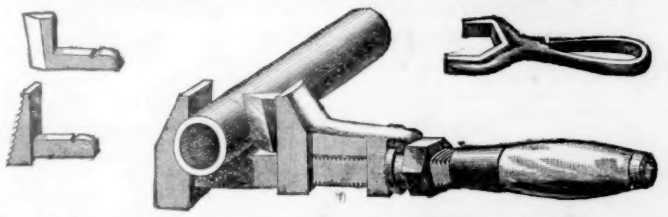
Larger Sizes made to Order at 25 cents per pound.

Guarantee.—All Bells sold at the above prices WARRANTED against breakage by fair ringing, for TWELVE MONTHS from time of purchasing. Should one fail, a new bell will be given by urning the broken one.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York.

In case a Bell breaks after the expiration of the Warrantee, I allow HALF PRICE for the old metal. JOHN B. ROBINSON, 36 Dey Street, N. Y.

WEBSTER'S PATENT WRENCH,



For Cutting Off & Screwing up Pipe, Round Rods, Bolts, Nuts, &c.

RECEIVED SPECIAL GOLD MEDAL FROM THE AMERICAN INSTITUTE
SEPTEMBER, 1865.

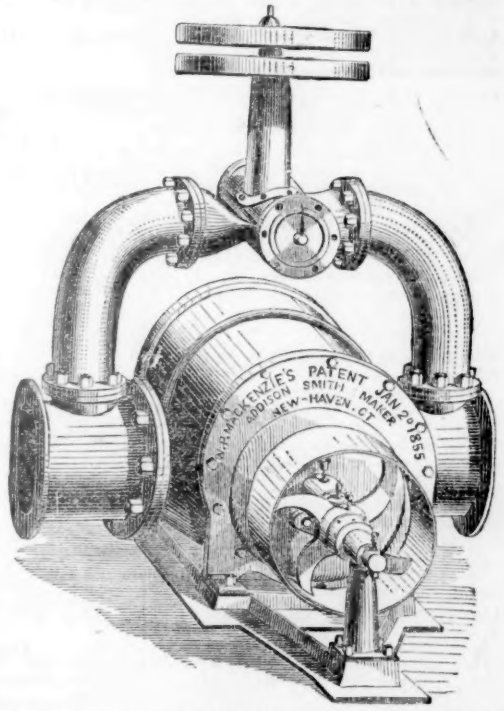
WEBSTER & CO.,

Sole Owners and Manufacturers, No. 17 Dey Street,
NEW YORK.

Smith & Sayre Manufactnring Company.

The Mackenzie Patent Gas Exhauster,

AND PATENT COMPENSATOR.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 ons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. fuel. Address

B. KREISCHER., Prest.
JAS. SAYRE, Treas,
CHAS. W. ISBELL, Sec'y. Office 484 Broadway, New York.

GAS-METER GLYCERIN.

WE SOLICIT THE ATTENTION OF GAS COMPANIES to our GLYCERIN, which is now generally known, and is undoubtedly the best article ever used for filling Gas meters. Glycerin of 15° Baume will stand 14° below zero without freezing, and the greater the density the lower the temperature it will stand.

We have sold to most of the large companies throughout the country, and annex a few certificates showing its value:

OFFICE OF THE CINCINNATI GAS-LIGHT & COKE CO., CINCINNATI, OHIO, NOV. 25, 1865.

I take pleasure in stating that the glycerin furnished by W. J. M. Gordon & Bro., of Cincinnati, has been used in wet meters by this Company during the past two years, and has proved very satisfactory thus far. Having resisted the action of frost, and not evaporated more than about six per cent. each year.

The standard for density being 15° Baume's scale.

H. I. MILLER, President.

OFFICE GAS-LIGHT CO., BALTIMORE, Dec. 16, 1864.

MESSRS. W. J. M. GORDON & BRO.—Of the numerous fluids used by this Company in their gas-meters to prevent freezing, none have given the satisfaction of the Glycerin manufactured for that purpose by the Messrs. Gordon & Bro., of Cincinnati, Ohio. As Glycerin will withstand a temperature below anything in the latitude of Baltimore without congealing, and as it does not evaporate like the alcoholic mixtures, once filling a meter will last for years. Yours respectfully,

J. MORTON SAUNDERS, Engineer.
COLUMBUS O'DONNELL, President.

Glycerin for Printers' Rollers.

It is coming into general use for this purpose, as rollers will not dry and shrink as when made in the usual way.

OFFICE OF THE DAILY & DOLLAR WEEKLY TIMES, CINCINNATI, NOV. 27th, 1865.

I hereby certify that I have used the Glycerin manufactured by the Messrs. W. J. M. Gordon & Bro., of this city, in the manufacture of printing rollers, and find it a most valuable addition to the composition in general use. THOMAS F. WINTER,
Pressman Times Office, Cincinnati, O.

November 29, 1865.

We have used the Glycerin manufactured by W. J. M. Gordon & Bro, of this city, for the last seven years. We find it in our line of business—printing playing cards, using colored inks to a great extent,—a very superior and indispensable article. We use about one-sixth quantity of it to the amount of molasses in making our rollers. We find it prevents them from shrinking up, and causes them to retain the desired "tack." We confidently recommend the article for the desired purposes. LONGLEY & BROTHER,
Playing Card Manufacturers, Cincinnati, Ohio.

Glycerin is also used by the Cincinnati Commercial and Enquirer, to whom we refer.

We manufacture Glycerine of every quality used, and from our advantage in material we are enabled to sell it lower than any manufacturer in the country.

W. J. M. GORDON & BRO.,
MANUFACTURING CHEMISTS AND DRUGGISTS.
63] N. E. Cor. Central-ave. and 8th-st., Cincinnati, Ohio.

GLYCERIN

For Wet Meters, Gasoline Machines, Hydraulic Presses, &c.

We warrant our Glycerine free from acid and not to corrode the Meter metal, or to congeal or freeze at a stated temperature—also, not to evaporate to any extent The advantages and savings derived from the use of our fluid can be testified by many Gas Light Companies which we have supplied. We only refer to the certificates of H. J. Miller, Esq., President of Cincinnati G. L. and Coke Co., and Dr. J. Lawrence Smith, Professor of Chemistry in the Louisville College, and President of the Louisville Gas Co.

HARTMAN & LAIST,

Office No. 41 East 2d street, Cincinnati,—Chemical Works on Providence street, and Miami Canal, near Findlay sreet.

CERTIFICATE

Office Louisville Gas Co., Louisville, June 28, 1865.

This is to certify, that the Louisville Gas Co have used for about two years, the Glycerine prepared by Messrs. Hartman & Laist of Cincinnati, in their Wet Meters, and have in all instances found it to give most perfect satisfaction. Prior to the use of the above Glycerin, we had employed that manufactured by other parties, and we consider H. & L.'s superior to any we used.

J. LAWRENCE SMITH, President.

Office Cincinnati Gas Light and Coke Co., July 7, 1865.

This will certify, that Messrs. Hartman & Laist of Cincinnati, furnished this Company with Glycerin for Wet Meters some two years since. It has proved very satisfactory, having resisted the action of frost during two winters and evaporating not more than six per cent. per annum, as guaranteed by them. The standard being, for density, 15 deg. Beaume's scale. They were the first to introduce it practically to this Company. H. J. MILLER, President.

☞ L. BRUCKMANN, 67 Wall street, Agent for New York.

Worthington's Steam Pump,

Extensively used by

GAS-LIGHT COMPANIES,

For sale at greatly reduced prices. Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

☞ Patent GATES for Water and Steam-stops. ☜

HENRY R. WORTHINGTON,
61 61 Beekman-st, New York.

PLASTIC SLATE ROOFING
JOINT STOCK COMPANY.

OFFICE 157 [Room 19] BROADWAY,

New York.

W. C. POTTER, Vice Pres't.
J. M. ALLEN, Sec. and Treas. LICENSES GRANTED.

PLASTIC SLATE
FOR
ROOFING & OTHER PURPOSES.

The process of reconstructing Slate Stone from a disintegrated state was

PATENTED FEBRUARY 21st, 1865.

It is a combination of

Fulverize late & Vi scous Matter,

(the latter possessing qualities of geological and chemical affinity for the former,) and is a development of one of the simple but unalterable tendencies of nature.

As a Roofing Material it Stands Unrivalled.

A mastic—it adapts itself to every shape and slope. Non-combustible, impervious, non-expansive, and undecaying.

Frost does not Crack nor Heat Dissolve it.

The only roofing material ever discovered that will resist the action of the elements as long as the structure it protects. Being susceptible of little, if any wear, from exposure, and

Perfectly Fire-Proof,

It is unequalled as a coating for Railroad and Farm Buildings, Fences, Bridges, bottoms of Vessels, Vaults, etc.

Edw'd Van Orden & Co.,

Manufacturers of Fire and Water-proof

Plastic Slate Roofing Materials,

ROOFING TOOLS, &C.

Office 41 Liberty-st.

Edw'd Van Orden. NEW YORK.
Jas. E. Dunn.

MILLS CONVENIENT FOR SHIPPING.

PARTZ & BUCK

MINING ENGINEERS, METALLURGISTS

AND

ANALYTICAL CHEMISTS,

57 BROADWAY,

A. F. W. PARTZ, C. ELTON BUCK, NEW YORK.

CHAS. HOWDON SMITH,

BROKER IN MINING STOCKS

AND OTHER SECURITIES,

No. 5 1-2 PINE STREET,

ROOM NO. 5. NEW YORK.

T. CASSIDY & CO.,

(SUCCESSORS TO P. CASSIDY,)

Dealers in Old and New

IRON, COPPER, BRASS,

LEAD, SPELTER, &c.

Corner of Bridge and John Streets,

BROOKLYN.

☞ N. B.—The highest cash price paid for the above named articles.

T. CASSIDY. 57-80 J. PEARCE.

NATIONAL FOUNDRY
AND PIPE WORKS.

Office and Works—Carroll, Pike, Smallman and Wilkins Streets,

PITTSBURGH, PA.

WM. SMITH,

Manufacturer of all kinds of GAS and WATER PIPE, BRANCHES, CONNECTIONS, T's, ELBOWS, and ALL CASTINGS USED AT GAS AND WATER WORKS.

I offer special inducements to parties wishing to purchase, my Pipe is Smooth, regular in weights, and cast vertically.

N. B.—Pipe from 3-inch and upwards, cast in 12-ft. lengths.

☞ SEND FOR CIRCULAR AND PRICE LIST. ☜
149

JOSEPH NASON & CO.,

No. 61 Beekman street, corner of Gold,

NEW YORK.

Manufacturers of WROUGHT IRON PIPES and Fittings for Steam, Gas and Water, Boiler Flues, Steam Boilers, Coils, Heaters, Evaporators, Pumps, Ventilating Machinery, and Apparatus for Warming Buildings by Steam and Hot Water.

OIL TUBING, CAST IRON DRIVING PIPE, Boring Tools, Oil Pumps, Sand Pumps, Stuffing Boxes, Tongs, Clamps, Swivels, Joints, &c. 131

BIRD, PERKINS & JOB.,

(Formerly J. P. Melledge & Co.,)

General Commission Merchants,

And Importers of

PROVINCIAL COAL,

For Gas, Steam and Iron Manufactures.

39 India Wharf,..... .....Boston.

SAM'L T. BIRD, JAMES D. PERKINS, DANIEL W. JOB. [134

Represented in New York by GEORGE H. BREWER, No. 104 Wall Street.

THE AUBIN BALANCED
VALVE WATER METER,

(Used also for Oils and Liquors)

IS NOW IN USE BY MANY CITY WATER Companies, because of its LOW PRICE, SIMPLICITY, DURABILITY, ACCURACY UNDER ANY PRESSURE, and, (a great advantage,) because it runs with less head than any other meter used.

Manufactured by

H. Q. HAWLEY,
Albany, N. Y.

BRAYTON'S
Patent Steam Generator,
AND ENGINE.

A PERFECT SUCCESS. BY THIS INVENTION the long sought-for object has been accomplished; to wit: A means by which steam can be generated safely, so that there shall be no more danger from explosion than with the hot-air engine, and at the same time retain all the power of the steam engine. This much sought for result has at last been accomplished, and after many severe tests we feel fully warranted in offering this Steam Generator and Engine to the public as a perfectly safe power, and at the same time a cheap power. As a generator of steam for heating buildings, etc, there is not its equal in use. For further information or circular, address

R. A. HUTCHINSON,
159-182 Agent, No. 8 Dey-street, New York.

H. P. GENGEMBRE'S

PATENT

Non Freezing and Non Evaporating
METER FLUID,

☞ Far cheaper than any other in use. ☜

For Filling Wet Gas-Meters, cheaper, in the long run, than water.

Six years in general use in works using it, to the exclusion of all other fluid, and driving the dry meter out of use, enables us to recommend the patent with perfect confidence.

For information and purchase of rights, apply to
A. DOISEY, Esq., Sole Agent,
Box 2,180, Cincinnati, Ohio, or to
H P. GENGEMBRE, Pittsburgh, Pa.

WILLIAM TAYLOR & SONS,
COLUMBIAN IRON WORKS,

Nos. 11, 13 & 15 Adams Street, Brooklyn, N. Y.

MANUFACTURERS OF ALL KINDS OF

Castings, Iron Buildings Store Fronts, Columns, Girders and Beams.

Steam Engines, Mill Gearing, Hydraulic Presses for the manufacture of Linseed and Cotton Seed Oils, Sugar Mills, Single and Double Action Pumps, also Steam Pumps, Coal Oil Machinery, High and Low Pressure Boilers, Tanks, Kettles, Soap Curbs, &c.,

MADE AND REPAIRED AT THE SHORTEST NOTICE.

WM. TAYLOR. JAMES A. TAYLOR. EDWIN S. TAYLOR.

CATALOGUE of Scientific, Military, Naval and Miscellaneous BOOKS just published, and sen free on application.

D. VAN NOSTRAND,

PUBLISHER,

163 192 Broadway, New York.

T. B. BYNNER,

IMPORTER AND DEALER IN WATCHES AND JEWELRY, Agent for the AMERICAN WATCH. Also every variety of Swiss and English watches, AT THE LOWEST MARKET PRICES.

189 BROADWAY, NEW-YORK.
Opppsite John Street. 62-85

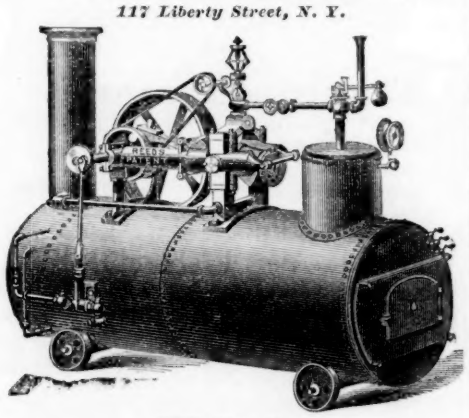
TURNBULL'S
AUTOMATIC PURIFIER.

STATE RIGHTS FOR SALE ON LIBERAL terms. For further information address by letter, WM. C. TURNBULL, care of T. C. Babcock, 59 Broadway, or to the Editors of this Journal.

REED & COGSWELL,

CONSULTING ENGINEERES,

117 Liberty Street, N. Y.



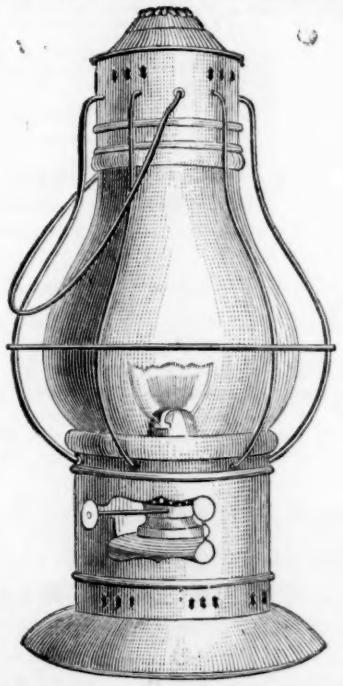
MANUFACTURERS OF

Slide & Oscillating, Stationary & Portable
ENGINES,

Of all sizes. Also furnish all kinds of MACHINERY, TOOLS, AND GENERAL SUPPLY. Drawings of all kinds of Machinery executed to order.

JOHN A. REED. [63-86] W. B. COGSWELL.

JAS. O. SMITH & SONS,
MANUFACTURERS of LANTERNS,



81 FULTON, 55 GOLD, AND 90 ANN STREETS, N. Y.

We would especially direct attention to LATE IMPROVEMENTS in our No. 4 SMITH'S LANTERN, (for which we have applied for patent,) having a GLASS LAMP so constructed that the light passes through the bottom of the Lantern; also, the guards are so arranged as to dispense with soldering the top part of the guard to the trimming, obviating the difficulty that so frequently occurs in other lanterns of the guards melting off.

We are manufacturing at our factory, Middletown, Conn., MANY OTHER STYLES AND SIZES, which can be seen at our Show Rooms, 81 Fulton-st., New York. TRIMMINGS, etc., always on hand.

☞ The Trade are invited to call and examine our Stock.

EDDY'S
Kerosene Cooking & Heating
STOVES AND RANGES.

THESE COOKING STOVES WILL
☞ *Bake, Boil, Stew, Fry and Roast,*

With the greatest economy and facility, and without heating the room in which they are used. They are perfectly simple, operating like an ordinary Kerosene Lamp with a chimney, and are the only Kerosene Stoves that burn without smoke or odor.

"We have been perfectly astonished to see what a labor-saving, dirt saving and heat-saving institution is EDDY'S PATENT KEROSENE STOVE. Taking the cost of running it, and the result attained, it is the best patent in the market."—*Worcester Daily Spy.*

Our Heating and Cooking Stoves are very convenient and economical, especially where a fire is required but a few hours at a time.

Orders for Stoves may be sent through American Advertising Agency, 389 Broadway, New York.

ALEX. M. LESLEY,
Manufacturers, No. 605 Sixth Ave., New York.
Send for Illustrated Circular. (136

KNITTING MACHINES
FOR
Families and Manufacturers,
☞ *Something New and Invaluable for Family Use.*

We offer the public the simplest, strongest and best Knitting Machine in the world.

It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

Orders for Machines may be sent through the American Advertising Agency,
389 Broadway, N. Y.

Send for a Circular—Agents wanted.
DALTON KNITTING MACHINE CO.,
137] 537 Broadway, N. Y.

WEED'S
HIGHEST PREMIUM
Shuttle Sewing Machine
Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 20 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance, it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency, 389 Broadway, N. Y.

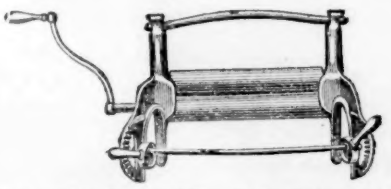
Below we give a few prices:

No. 2.	Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2.	Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3.	Extra Oil Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

WEED SEWING MACAINE Co.,
130, 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE
Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day.

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*
That a *simple* machine is better than a complicated one.
That a Wringer should be *self-adjusting, durable, and efficient.*
That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.
That wood soaked in water will *swell, shrink,* and *split.*
That wood-bearings for the shaft to run in *will wear out.*
That the Putnam Wringer, with or without cog wheels, will *not tear the clothes.*
That cog-wheel regulators are not essential.
That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.
That all who have tried it pronounce it the *best* Wringer ever made.
That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January,* 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any,* to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.
Sample Wringers sent, express paid, on receipt of price.
Manufactured and sold, wholesale and retail, by
PUTNAM MANUF'G CO.,
13 PLATT STREET, New York,
BENNINGTON, Vt.,
CLEVELAND O.

C, GEFRORER,

MANUFACTURER OF

Gas Heating Apparatus

OF EVERY DESCRIPTION,

Gas Burners, &c.

No. 529 COMMERCE STREET,

PHILADELPHIA, PA.

Burners for Wood Coal Oil and Water Gas
Gas and Lava Burner Tips
Constantly on Hand. 65

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, President. HENRY CARTWRIGHT, Vice President. RICHARD MERRIFIELD, Secretary and Treasurer

Trustees.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.

THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS AND REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty-Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishment, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by

HARRIS & BRO., No 1117 Cherry st., Philadelphia.

Messrs. Harris & Brother, Philadelphia Gas Works, February 14, 1857.

Dear Sirs;—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000.

John C. Cresson, Engineer;

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entire satisfaction in point of wokmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.

G. S. Hookey, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia. Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanship all we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, Birkinbine & Mears.

Messrs. Harris & Brother. March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their correctness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those imported from Europe, or made by any of the manufactur in the United States. Respectfully Yours George Wiegand, Inspector of Gas Fittings, Philadelphia

C. GEFRORER,

MANUFACTURER OF GAS BURNERS,

529 Commerce Street, Philadelphia, Pa.

Burners for Wood, Coal Oil, and Water Gas. Brass and Lava Burner Tips Constantly on Hand.

GROVESTEIN & CO.,

PIANO FORTE MANUFACTURERS,

499 BROADWAY, NEW YORK.

THE ATTENTION of the public and the trade is invited to our New Scale, Seven Octave, Rosewood Piano Fortes, which for volume and purity of tone are unrivalled by any that have hitherto offered in this market. They contain all the modern improvements, French Grand Action, Harp Pedal, Iron Frame, Over-strung Bass, etc., and each instrument, being made under the supervision of Mr. J. H. Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"
RECEIVED THE HIGHEST PREMIUM AT THE
CELEBRATED WORLD'S FAIR.

Where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of improvement we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES!

No. 1,	Seven Octave,	round corners,	Rosewood, Plain Case,	$275
No. 2,	"	"	" Heavy Moulding	300
No. 3,	"	"	" Louis XIV style	325

a fac-simile of the accompanying cut.

TERMS—Net Cash, in current funds Descriptive circular sent free on application.

MORRIS, TASKER & CO.,

PASCAL IRON WORKS

[ESTABLISHED 1821,]

PHILADELPHIA,

Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,

ARTESIAN WELL PIPES,

of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.

Gas and Steam Fitters' Tools, &c.

STEPHEN MORRIS,
THOMAS S. TASKER,
CHAS. WHEELER,
STEPHEN M. P. TASKER.

J. VAUGHAN MERRICK, W. H. MERRICK,
JOHN E. CORE.

SOUTHWARK FOUNDRY,

FIFTH & WASHINGTON STREETS,

PHILADELPHIA.

MERRICK & SONS, Engineers,

MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.

Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gas Holders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam of Hand Air Pumps for providing Street Mains, Centre Seals, Governors, Wrought or Cast-Iror, Line Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.

Address— MERRICK & SONS,
5th and Washington Sts, Philadelphia.

S. FULTON & CO.,

(Successors to Colwell & Co..)

Manufacturers of

PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heavy & Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

SAMUEL FULTON, THEO. TREWENDT

TO GAS COMPANIS.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works
417 Walnut st., Philadelphia.

POOLE & HUNT,
BALTIMORE, MD.,
are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

GEO. H. KITCHEN & CO.,

NEW PATENT

GAS APPARATUS

For Country Residences, Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its banches

561 Broadway,
NEW YORK.

THE WOODWARD Steam Pump Manufacturing Company,

MNUFACTURERS OF THE WOODWARD P ATENT IMPROVED

SAFETY STEAM PUMP,

—Adapted for Mining and Fire Purposes—and

Steam, Water & Gas Fittings of All Kinds.

Also, Wholesale and Retail Dealers in WROUGHT IRON PIPE, BOILER TUBES, etc.,

Woodward Building, 76 and 78 Centre Street,

corner of Worth street,
Formerly 77 Beekman Street, *New York.*
53 GEO. M. WDDOWARD, Pres't. 64

JOSEPH LENNIG,

1615, 1617, and 1619 Francis St.,

Above Ridge Avenue, Philadelphia, Pa.,

MANUFACTURER OF

Wet and Dry Gas Meters,

STATION, SHOW, & EXPERIMENTAL METERS,

Photometers, Pressure Registers, Indicators, and Gauges, Governors, Meter Provers, Centre Seals, Fluid Gauges, &c.

GAS APPARATUS

Of the most reliable and approved construction manufactured and on hand at the

UNION GAS METER WORKS.

D. PARRISH, Jr.,

GAS ENGINEER

And Contractor for Coal or Oil Gas-Works.

Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.

205 1-2 Walnut st., Philadelphia, Pa.

Box 1956, Post Office.

To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

SAVING OF FUEL TO PARTIES USING STEAM.
DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York.

THE AUBIN BALLANCED

VALVE WATER METER,

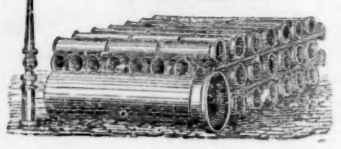
(Used also for Oils and Liquors)

Is now in use by many City Water Cos, because of its low price, simplicity, durability, accuracy under any pressure, and (a great advantage) because it runs with less head than any meter used. Manufactured by H. Q. HAWLEY, Albany, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

J. D. WEST & CO.,
No. 40 Cortland street,

R. D. WOOD & CO.,
MANUFACTURERS OF
CAST-IRON PIPE, RETORTS, &c.
Office, 400 Chestnut Street,
PHILADELPHIA.



Great Improvement
IN
Sewing Machines.
EMPIRE
SHUTTLE MACHINE!

Patented February 14th, 1860.

Salsroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather to the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbers.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,

COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2. Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably Cash on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

GAS-BURNERS.

WIGHTMAN BROS.,

IMPORTERS AND

SOLE AGENTS

For the United States and Canada, of

SCHWARZ'S

GERMAN LAVA GAS-TIPS

And proprietors of Winchester's Improved

LAVA TIP GAS BURNERS,

No. 25 Kilby Street,

BOSTON, MASS.

T. G. ARNOLD,

MANUFACTURER OF

GAS-BURNERS

And Importer of SCOTCH TIPS,

224 and 226 West 21st street,

formerly No. 447 BROOME ST., New York.

Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,

Manufacturer of

GAS-BURNERS,

For Lighting and Heating Purposes.

GAS HEATING AND COOKING APPARATUS; FITTERS' ROVING APPARATUS, &c.

529 Commerce st., bet. Market & Arch, Philadelphia

JOSEPH LEES,

Sole Agent for the sale of

Thompson's Gas Controller

In the States of

CALIFORNIA AND OREGON,

San Francisco, Cal.

Carrington & Co.'s
GENERAL
PURCHASING
AGENCY,
In Connection with all the Expresses
No. 30 Broadway,
NEW YORK.

Established 1854.

Purchases to order any article wanted from New York, or Europe, for ladies' or gentlemen's use or wear,---comfort or luxury,---from a cameo to a cashmer, a seal ring to a steam engine.

Goods purchased at current City prices, and forwarded by Express or as directed.

Commission, Five Per Cent

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

THE HAVANA
MEXICAN & BRAZILIAN
EXPRESS.

CARRINGTON & CO.
30 Broadway.

Express for HAVANA and ISLAND OF CUBA by regular steamships weekly.

Express for MEXICO and VERA CRUZ on the 10th and 16th of every month.

Express for ST. THOMAS, BAHIA, and RIO DE JANEIRO each month.

Packages received for United States Brazil Squadron.

Freights should be sent to our office day before sailing of steamer, with invoice, contents and value.

FINKLE & LYON'S
New Family
SEWING MACHINE

Should be known in

IN EVERY TOWN.

To accomplish this at once and save the expense of a *Travelling Agent*, we offer thus, viz:

Any one sending us orders for two machines shall receive one machine free of charge. This proposition cannot avail after we have appointed a local agent in the town.

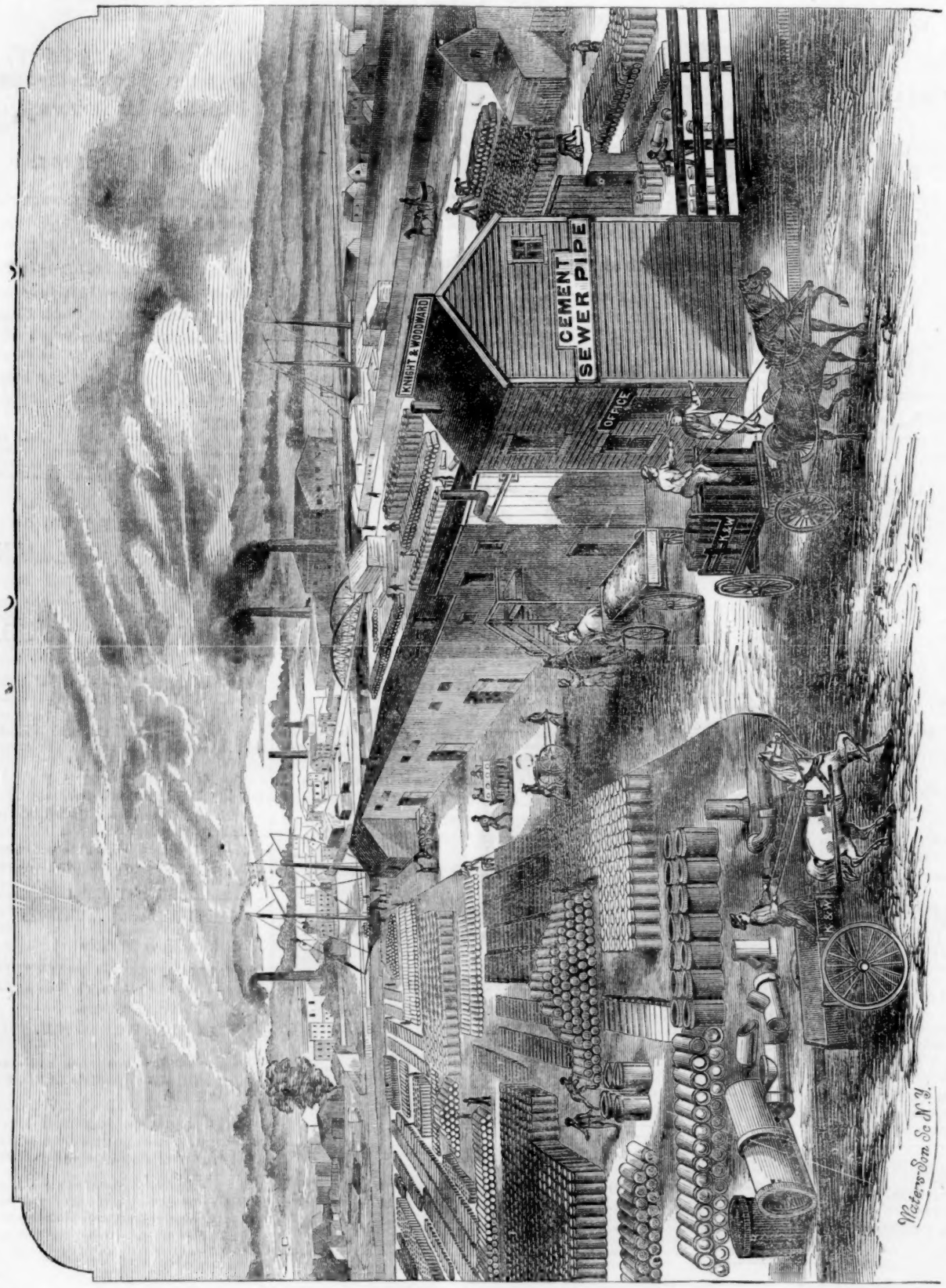
We have now completed our *new manufacture* at a cost of some $200,000—introducing *new patents*, and such important improvements, that without fear we are able to offer the following stringent guarantee, viz: After a fair trial, if any purchaser does not prefer the FINKLE & LYON FAMILY SEWING MACHINE to any other, he can return it and have back his money.

This machine has taken many of the HIGHEST PRIZES; *is less complicated than any other first class machine; does a wider range of work without changing; requires no taking apart to clean or oil, no "lessons" to set needle, regulate tension or operate machine.*

Our new Manufacturing Machine is sold on the same terms as the Family Machine.

Please send for a circular with samples of sewing.

Finkle & Lyon S. M. Co.
No. 581 BROADWAY, NEW YORK.



CEMENT PIPE MANUFACTORY OF KNIGHT & WOODWARD.

"KNIGHT'S PATENT."

CORNER UNION AND BOND STREETS, GOWANUS CREEK, BROOKLYN.

OFFICE IN NEW YORK, No. 10 READE STREET.

HENRY KNIGHT. JAMES L. WOODWARD.

CEMENT PIPE, "KNIGHT'S PATENT," IS ALSO MANUFACTURED AND FOR SALE BY

Franklin Gerard, Newburgh, New York.
Warner & Co., Albany and West Troy, New York.
Jones & Haworth, Utica, New York.
Bassett Bros, Syracuse, New York.
D. Copeland, Jun., Rochester.
Copeland, Rathbun & Co., Buffalo, New York.
J. P. Wilcox & Co., Springfield, Mass.
A. B. Lovell, Worcester, Mass.
Day & Collins, Boston, Mass.
Simeon Flint, Salem, Mass.
Caleb Crosby, Lowell, Mass.
Rheem & Giles, Georgetown, D. C.
Scowden & Co., Louisville, Ky.
Sprague & Crooker, Toledo, Ohio.
American Water and Gas Pipe Co., Jersey City, N. J.
New Haven Pipe Co., New Haven, Conn.